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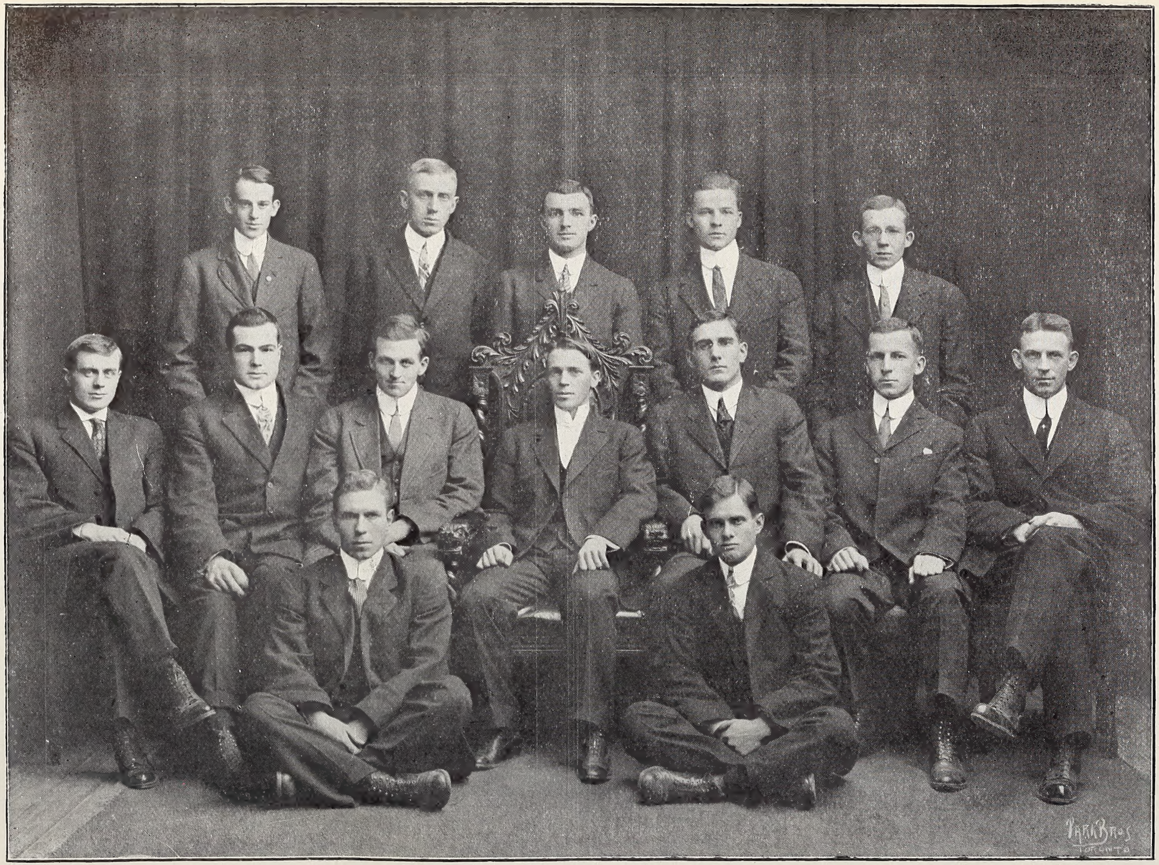

UNIVERSITY OF TORONTO ENGINEERING SOCIETY EXECUTIVE, 1910-11

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Applied Science

INCORPORATED WITH

TRANSACTIONS OF THE UNIVERSITY OF
TORONTO ENGINEERING SOCIETY

Old Series Vol. 23 APRIL, 1911 New Series Vol. IV. No. 6

IMPRESSIONS OF ENGINEERING IN GREAT BRITAIN.

CHESTER B. HAMILTON, JR., B. A. Sc.

The Institution of Mechanical Engineers, whose headquarters are in London, England, last year invited the American Society of Mechanical Engineers to hold a joint meeting with them, during the last week of July, 1910.

The official party of the American society, numbering about 150, left New York on the White Star liner "Celtic," on July 16th, while about as many more went earlier.

We arrived in Liverpool on the evening of July 24th, and were met at the mouth of the Mersey by a tender, which brought out a deputation from the Lord Mayor of Liverpool, and from the Institution of Mechanical Engineers.

From that point on the time was so crowded with engineering and social opportunities that it made one wish that there were at least forty-eight hours in the day. Our English friends certainly are the kindest of hosts. The convention lasted a week, first at Birmingham, then at London, stopping over a day on the way at different points of interest. All the numerous side excursions throughout the week were arranged so that people of the most varied tastes might choose according to their preferences, and thus everyone might be satisfied.

The convention closed Sunday evening, with a visit to Westminster Abbey, around which we were conducted by the sub-Dean. The engineers were particularly interested in the memorial window to Sir Benjamin Baker, the builder of the Forth Bridge and the Assouan Dam.

The following day the party began to break up, the members going where the greatest interest drew them. The writer went to Holland and Belgium and the Brussels Exposition; then returned to England, visiting as many engineering and manufacturing plants as possible, and finally took a short trip to Scotland.

In general it may be said that in all matters touching on either the navy or merchant marine, one may look for the highest efficiency in British works or factories.

The new Yarrow shops on the Clyde, building torpedo boats and destroyers, are an example. They are not very large, compared to some of the other great works, but they are as good shops as I have ever seen—high, well lighted and ventilated, good crane service, and general orderly arrangement. One of the features is a roofed-over "water-dock" (this name being used in distinction to a dry-dock), equipped with electric traveling cranes, under which the destroyers are fitted up after launching. Only turbine engines are now used, along with the famous Yarrow watertube boilers. It was rather a surprise to see them building destroyers for Holland—a maritime nation itself. They were also at work on boats for Denmark and Brazil. These latter are taken to Brazil by their own black and mulatto crews, but the Yarrow's send one or more engineers from their shops to insure their arrival, which otherwise might be doubtful.

At Cathcart, a suburb of Glasgow, I visited the Wier Pump Works. They build only direct acting steam pumps of very high grade, principally for marine use. This is another first class shop, with both its general methods and details more carefully worked out than usual. The principal part of the shop is one storey with saw-tooth roof. A line shaft down each row of columns drives the machines in that bay; power is supplied by a horizontal single cylinder gas engine at the end of each bay, using producer gas. Thus they get most of the advantages of group drive, as the number of machines on each shaft is small; and also get very cheap power and high efficiency, for the transmission is short and direct. There are almost no motor drives in this shop. They have little to gain, and the management fears the expense for maintenance of 1,500 small motors. They use a large number of Reeves' variable speed friction gears, where an electrically driven shop would use interpole motors, and by fine adjustment of the speed of the machines are able to get the highest efficiency from the tools. They like the Reeves gear very much, and are applying it to most of their new tools.

A large number of their machine tools are made especially for the job for which they are intended, thus they are simpler, more rigid and accurate, and sometimes cheaper than standard tools, as they do away with unnecessary adjustments, slides, and universal features.

They have a very good foundry for admiralty bronze, where they do first class work. They are under the difficulty of having to use very poor, almost gravelly moulding sand. They have a good system of standardized flasks and large patterns, divided into sections the same length as the depth of one section of the flask. In this way the mould can be given to a number of different men to finish at the same time, thus making greater speed possible. Every convenience is supplied the men to enable them to turn out high grade work efficiently. This foundry was a great contrast to one in Birmingham, making builders' hardware by most antiquated methods. I account for this by the fact that the Birmingham firm were not doing marine work. The Wier Pump Co.'s methods evidently pay, for they claim, with apparent right, to be the busiest shop in Great Britain, employ 2,000 to 2,500 men under good working conditions, and are putting up additions to their shop, while some other people are struggling to keep out of the receiver's hands.

The Vickers Maxim Co. and the Sir Wm. Armstrong, Whitworth Co. are two of the largest iron-working firms in the world. They both make almost everything, but, of course, specialize in work that is too big for other firms.

One of our party was talking to Mr. Matthews, the managing director of the Armstrong, Whitworth Company, without knowing who he was, and asked him what line he manufactured. He replied: "Oh, anything you like," adding in explanation, "anything from a ten-penny nail to a fully equipped battleship."

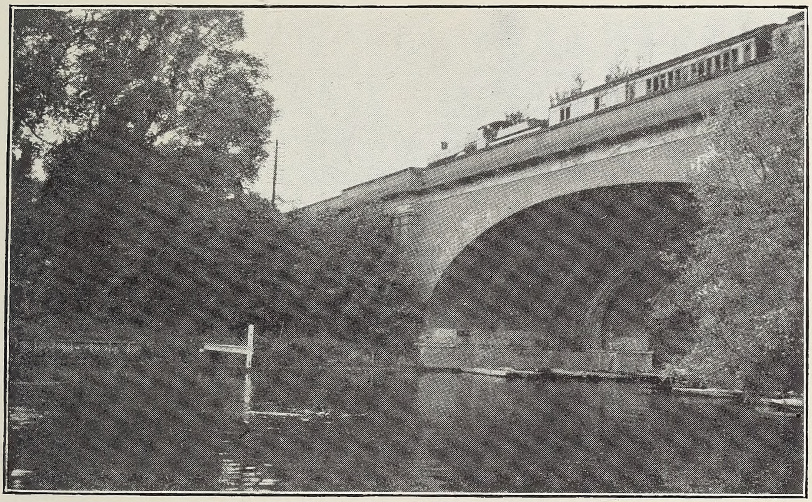


Fig. 1 Brick Arch Railway Bridge on the Thames.

In the Whitworth shops I saw a very large and heavy engine lathe, specially built for another company, to machine the parts of large marine steam turbines. This lathe was large enough to swing a small room over the ways, and so heavy that the ground in the purchaser's shop would not support it, and shipment had been delayed till another site could be found. Another machine tool not seen in this country is the armor plate shaper. These machines somewhat resemble a radial drill (on much larger scale, of course), having a very long arm with an auxiliary support at its end. The tool carriage slides on the horizontal ways on the arm (like the drill head), and is driven by a multiple thread lead screw of rather long pitch. A double tool is used, so that a cut is taken on both forward and return strokes. The machine is used for cutting armor plate and finishing the edges. Such great works as these have facilities for setting up in the shop the complete side armor of a battleship, to insure its accuracy of fit before it is sent to the shipyard.

In the Whitworth shops there are almost no automatic machines. They use a large number of boys on cheap lathes on work that could probably be better done on a screw machine. They do this in order to train up a sufficient supply of good lathe hands. This question of an extensive apprenticeship system versus automatic tools seems to be one of the weak points of the American method, which tends to produce a shortage of really skilled mechanics.

At the Vickers Maxim shops I noted the remarkable way in which government work is done in an open shop and yet kept secret. I saw many parts of H. M. S. "Lion" and another ship of the super-Dreadnought type, and was told that the information that such a ship was being built had only become known after practically all her parts had been completed.

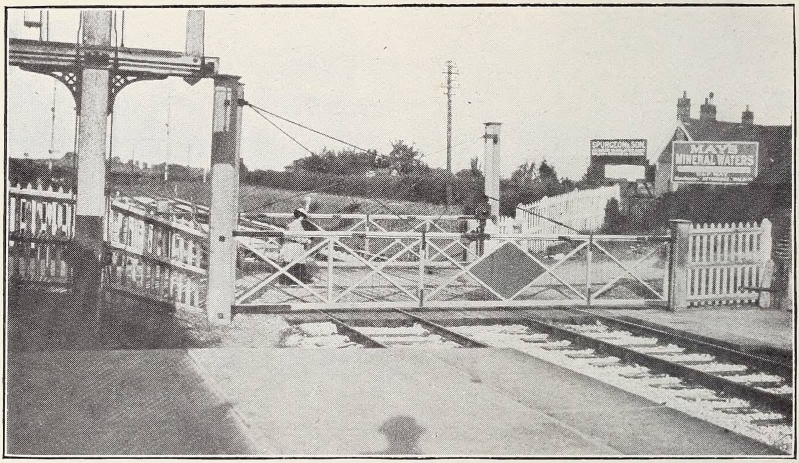


Fig. 2. Crossing Gates on an English Railway.

At Wier's Pump Works, at Glasgow, I was shown the condenser pumps of a great ship, which they were forbidden by the purchaser to speak of except by its shop-order number. The jealousy between rival trans-Atlantic steamship companies assists in the maintenance of secrecy, for no one could tell whether these pumps were for a Cunard or White Star ocean greyhound or a British or a Brazilian Dreadnought, though it was evident to anyone that they belonged to a record-breaking engine-room equipment.

It is extremely difficult to keep any secrets now that Japanese inspectors on Japanese Government work are in the shops, for they go everywhere with sharp eyes and notebooks. Vickers used to build complete ships for the Japanese. They made the guns for their latest Dreadnoughts, but the Japanese are building the ships themselves. Soon the Jap will be making guns and all.

A rather interesting machine tool is in use at Vickers (and probably elsewhere) for cutting the portholes in armor plate and for boring out large ingots and forgings preparatory to hollow-forging them on a mandril for the parts of heavy guns. Its action is quite analagous, but on a much larger scale, to a diamond rock drill. The boring bar is hollow and carries a series of cutters arranged around the end so as to cut out an annular channel and leave a large core, thus effecting a large saving of time and power.

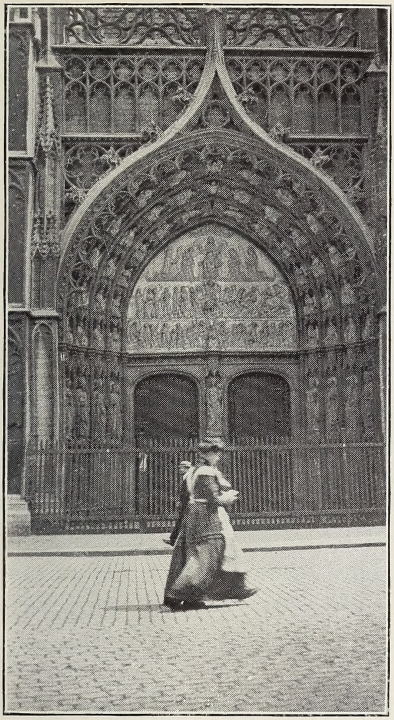


Fig. 3. Entrance to the Cathedral, Antwerp.

Fig. 4. Motor Busses, Trafalgar Square, London.

These great shops, Vickers, Maxim's and Armstrong, Whitworth's, are too big for appreciation or comparison by any standards we have in Canada.

Reference was made above to a foundry in Birmingham, where very poor methods were in use, both mechanically and in the treatment of the employees. A considerable proportion of the latter were women and children, who were working under "sweat-shop" conditions. This place, I understand, was typical of many others. Piece work was the rule, and the rate was so low that they had to work in desperate haste for long hours to earn very small wages.

Malleable iron castings were being made in small crucibles (60 to 100 lbs.) The moulders worked in groups of three under a contract system in little half-open sheds around the side of the yard. No moulding machines were used. None of the patterns were carded, all being in loose pieces, and the moulder had to cut the gates for every little piece, weighing, perhaps, only a few ounces, every time it was moulded. In the electro-plating room there was no efficient ventilation. The operators, who were young girls, were working in a choking atmosphere. What little machining there was on this class of work was done by child and female labor, in a half-lighted basement, with poor tools and, as always, at extreme speed.

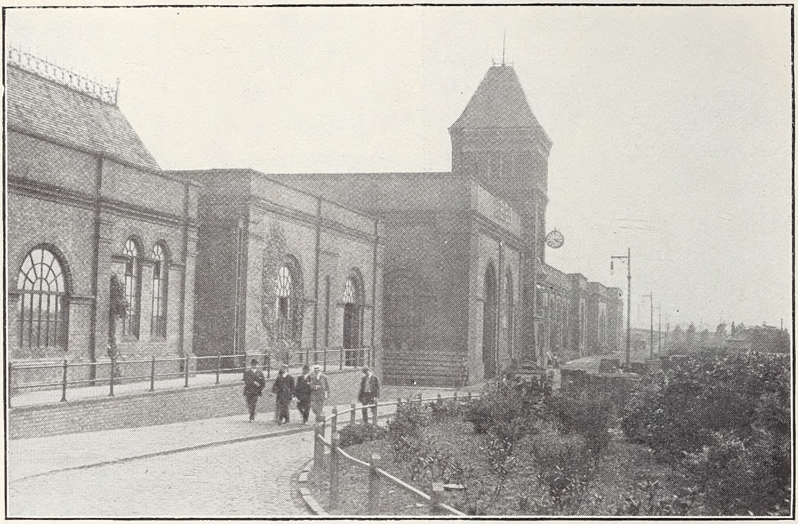


Fig. 5. Willans & Robinson's Engineering Works, Rugby.

In going through the factory districts there was opportunity to observe much more of the poverty of the country than is seen by the ordinary tourist. And it is not the poverty of hard times or accidental misfortune, but a deep, hopeless state, from which there seems no escape. What encouragement can these "submerged" ones take from the news that the Ontario manufacturer, the Manitoba wheat farmer, and the new Transcontinental railways are in need of labor? None, for that is on the other side of the world, and, besides, many of them are mentally and physically unfitted by heredity and environment.

One impression of the whole country is that it is a land where people and human effort and human suffering is cheap and material is expensive, in contra-distinction to America, where raw material is cheap and people are relatively more important. In Holland and Belgium dogs are much used for light draught. One American engineer said: "This is a fine country, but I'd hate to be a dog here." So I would say that England is a great and wonderful country, but I'd hate to be a laborer or mechanic there. I thought many times of Goldsmith's lines in "The Deserted Village":

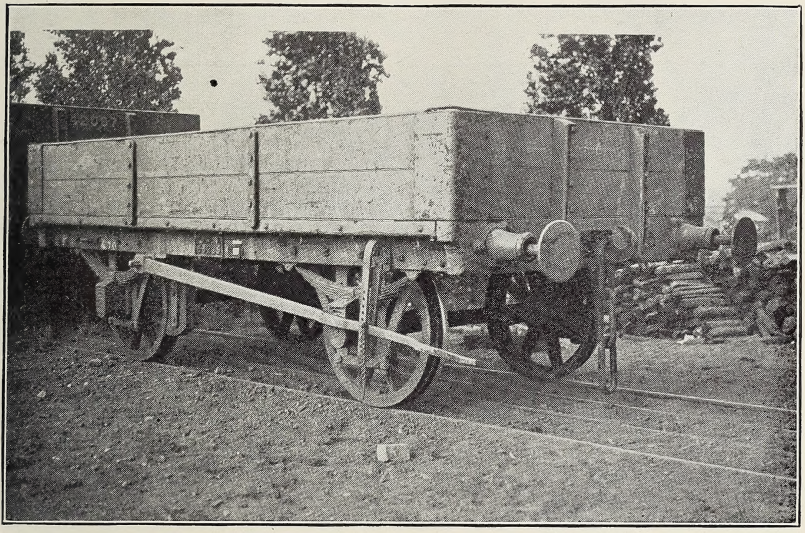


Fig. 6. English Goods Truck.

"But a bold peasantry, their country's pride,
When once destroyed, can never be supplied."

Messrs. Webley and Scott occupy, for the manufacture of revolvers and automatic pistols, a rather old, crowded, and badly arranged building, and the speed of production is high, but the quality of their output is of the highest, and the workpeople seem intelligent and comfortable. Is the explanation of this that theirs is the trade of the armorer, which, with its companion, the shipbuilder, holds such a premier position in Britain? In this large shop there was not a drawing or a scale to be seen, outside the tool room, everything being made to standard jigs and gauges.

The illustration of the Willans and Robinson shop, at Rugby, shows the handsome building and the fine gardens and shrubbery about it. The works are arranged so they can be enlarged to double the present size by extending sideways without disturbing any of the departments. All this reserve is given to the workman for garden plots. A large and elaborate testing plant has been provided, adjoining the power house, and connected to the rest of the works by a three-foot gauge railway system. Here careful tests can be made on engines, turbines, and pumps under almost service conditions, before shipment. The departments in the remainder of the works are conveniently arranged in series, as follows, from rear to front: Pattern storage, foundry, casting storage, forge and machine shops, erecting bays, packing and forwarding department, pattern shop, and office. It will be noted that, with the exception of the pattern shop and office, this is the logical order in which work would pass through the shops.

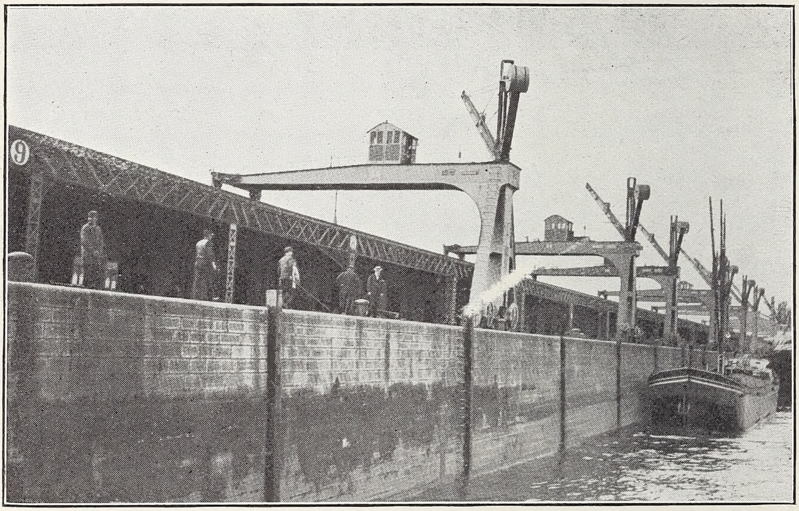


Fig. 7. The Dock Cranes at Antwerp.

The famous Willans engines were formerly made here in large numbers, but of late the principal output of this company has been steam turbines, Diesel engines, turbine pumps, and condenser apparatus.

Traveling so much away from the beaten track of the tourists gave a good opportunity to compare European with American methods of handling passengers. To be quite frank, they were generally not such as to excite admiration. We have all heard how the pirates used to make their victims "walk the plank." A modern repetition of this may be seen in the method of unloading second and third-class passengers at Queenstown, which resembles also the way cattle are handled at the large packing houses. Rain, wind, and the hour of 3 a.m., all added to the situation. The "victims" were compelled to carry their own hand-baggage, which averaged more than two pieces per person, down a long, narrow, slippery gang-plank, poorly provided with cleats and rails, at a slope of between 40 deg. and 45 deg. One end of the plank swung with the motion of the ship, and the other with that of the tender, which was to take the passengers ashore.

English trains accelerate more rapidly than our heavy American rolling stock. In view of this it was a real disappointment one day to find that a train which was already half-way out of the station could be overtaken and boarded. The fact that a fine or imprisonment is provided for boarding a train in motion was not known then.

In the eyes of an American the compartment system is altogether objectionable. The best trains now are constructed on the corridor plan, but they are so narrow that they are not in the same class as American coaches. The complete absence of any baggage checking system is a very bad feature of English travel. The responsibility rests entirely on the passenger to see that his baggage arrives at the same place and time as himself. In this connection it was necessary to use the long distance telephone several times, and I found both the service and the clearness of transmission far below what would be tolerated in American or Canadian practice. Telephones are not used in England to anything even approaching the extent they are in this country.

Fig. 8. Working on the Dykes, Holland.

English express trains are equipped with the Vacuum brake, but many passenger cars and all freight cars are without brakes. The illustration shows an arrangement, which is called a brake, used only for holding a freight car on a siding. Some freight locomotives have only hand brakes. Automatic couplers are unknown, the three chain links being universally used. On passenger equipment the middle link screws up like a turnbuckle, drawing the cars together and compressing the spring buffers. This makes the train very smooth in starting. In coupling cars an implement called a coupling hook is used which resembles a garden hoe with the wide blade cut off and the iron spike twisted like three-quarters of a turn of a corkscrew. Thus a man need not go between the cars—provided he has a hook with him.

One advantage, however, of the great amount of slack in a train of such cars is that less tractive effort is required to start from rest a train of these than one of equal tonnage of close-coupled cars. Consequently English locomotives are light, particularly as to weight on the drivers, compared with American engines. It seems that this, along with the light weight of the cars is the real reason for the smooth roadbeds of the English railways. Great pains are taken in building the roadbeds, which certainly reduces the maintenance cost, but it is doubtful whether they would stand the extreme hard usage to which American roadbeds are subjected much better than ours do.

Fig. 9. Dutch Windmill.

The oddity of shipping merchandise, often perishable, in open "goods trucks," covered only with tarpaulins, strikes the Canadian visitor strongly. These "goods trucks" and "goods vans" are exactly like the pictures in an old book I have which was published over thirty years ago. Apparently there has been no substantial change or improvement in this rolling stock in the last thirty or forty years. The ordinary goods truck is ten or twelve feet long over all, and carries ten or twelve long tons. To ship a sixteen-foot board requires two cars, unless it can be arranged to overhang the next load. The small size of the standard tunnels is one of the great obstacles to the English railways.

After all, no matter how far the English railway falls short of American and Canadian standards and requirements, we must remember that it fills the English requirements satisfactorily, and carries the inland traffic of a great nation with greater speed and safety than is the case with American or Canadian railways.

Figure 2 shows an arrangement of crossing gates, which affords great safety, but could probably not be applied in a country having much snow.

American locomotives have been tried in England, but have been found unsatisfactory. The material and workmanship are both much inferior to those in English engines. English engines all have solid copper fireboxes, and many have copper tubes. The English idea seems to be to make machinery as good as possible, whether it is economically worth while or not, while the American way inclines toward building only to last till the time when the design will probably be out of date. Each method suits the conditions of the respective countries.

In urban traffic the horse is rapidly disappearing. The taxicab replaces the hansom and the motor-bus its horse-drawn predecessor. The type of motor-bus used in London is shown in the photograph of Trafalgar Square.

Figure 1 shows a brick arch railway bridge of very good design. This compares favorably with some of the recent reinforced concrete arches. The centre span of this bridge is said to be the longest brick arch in Great Britain.

It was said that the only important features in Antwerpt were the cathedral and the method of handling freight on the docks with gantry cranes. Whether this is true or not I cannot say, but these two items at least are worthy of the admiration of the architect and the transportation engineer.

Figure 8 shows a rather inefficient but very industrious application of hand labor to the making of additional land on the Zuider Zee, in Holland. The material is dredged up from the bottom of the sea, some sixteen feet, and filled in between the old dyke and a new one (not shown), thus making one more farm.

There is, on a trip like this, an almost unlimited opportunity for American engineers to observe new and useful methods, and we were all deeply grateful to the Institution of Mechanical Engineers for their very great kindness.

BUOYS FOR CURRENT READINGS.

E. R. GRAY, '13

Under instructions from Mr. C. H. Rust, C.E., City Engineer for Toronto, a series of observations were conducted during the summer of 1909, dealing with current movements in Lake Ontario, near Toronto. At the outset it was found rather difficult to obtain a type of float which would give a satisfactory indication of the true direction, and rate of flow of the subsurface current without it being unduly affected by wind or surface motion.

In the first instance a metal float of the type and dimensions shown in Fig. 1 was used.

It consisted of a double cone-shaped, air-tight float, made of tin, to the top of which a short length (2 feet) of 1-4 gas piping was attached. This rod carried a small movable sheet-iron flag, by which the buoy was located when in use.

At the lower end of the float more piping was fastened, the length of which depended upon the depth of current to be gauged.

A sheet of galvanized iron 12 in. x 4 in. was then fixed rigidly to the lower end of this rod, to take the pressure of the current.

It will readily be seen that the large area which the body of this float offered to the wind and surface current, was out of all proportion to the small vein attached to the rod below, and that if, in turning, the vein offered its thin end to the direction of the current, there was practically no subsurface resistance plane.

This buoy was soon discarded, as no reliable results of the movement of subsurface currents could be obtained.

The buoy as shown in Fig. 2 was then tried with fairly satisfactory results, but proved so heavy and cumbersome that it soon gave way to a better type, viz., that shown in Fig. 3. The second style of buoy consisted of a small block of oak 4" x 4" x 6", to the centre of which a small swivel was stapled. Varying lengths of copper wire, No. 18, dependent upon the depth for which the buoy was to be used, were fastened to the swivel.

To the loose end of the wire a slight strip of wood, about two feet in length was attached, and to the other end of the strip a small piece of white cotton was tacked, in order to facilitate the location of the buoys on the water.

About the middle of this strip, two or three ordinary net corks were wired in order to carry the strip upright, when the oak block was weighted carefully to the proper depth.

On account of the weight of the oak block, which frequently

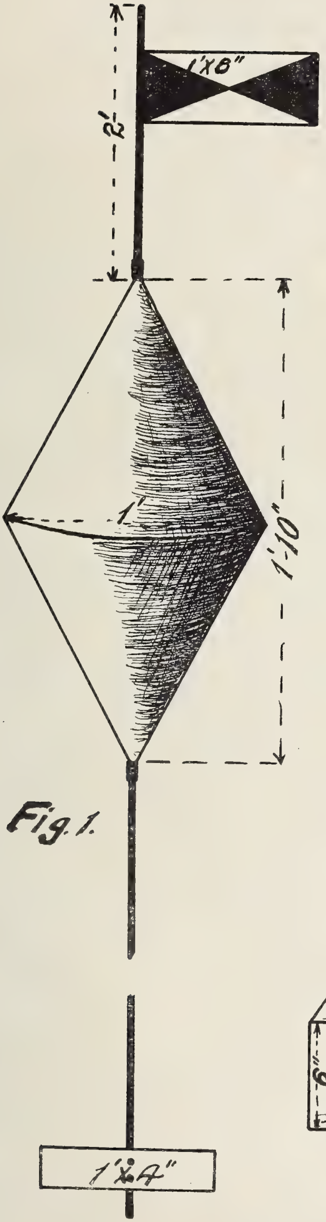


Fig. 1.

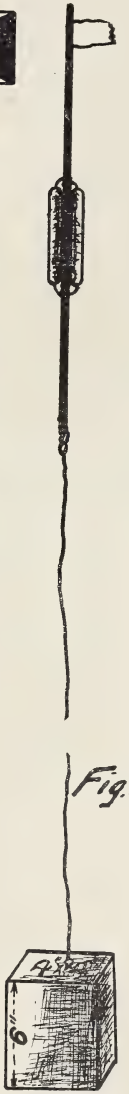


Fig. 2.

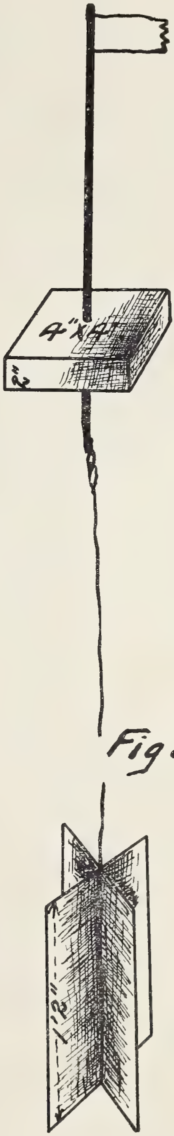


Fig 3

broke loose, this buoy was abandoned, and the type shown in Fig. 3 substituted with better results.

Two pieces of tin 10″ x 14″ were riveted together down the centre with three copper rivets. The opposite sides of both pieces of tin were then bent through ninety degrees, thus forming two vertical planes at right angles. A hole was punched at the centre of one end and through it a copper wire loop was bent. To the loop was fastened an end of the required length of copper wire, forming the submerged part of the buoy.

The float was made of a block of cedar 4″ x 4″ x 2″, painted to keep out the water. Experiments with other woods demonstrated the fact that cedar gave the best results for buoyancy and economy. In the centre of the block a small hole was bored, through which a strip of wood about 2 feet long was passed, allowing some six inches to project from one side.

To the long end a small piece of white cotton was tacked to act as a flag and to the lower end a small loop was wired.

To complete the buoy the loose end of the wire attached to the submerged vein is fastened through this loop.

It was found that the use of a loop in attaching the wire to the float was a good plan, otherwise the continual swinging and bending motion given to the float by the movement of the waves broke the rigid wire fastening, resulting in the loss of buoys and a negative observation.

With this buoy, then, it will readily be seen that extremely accurate results may be obtained regarding the movement of subsurface currents. The small cedar float and mast offer very little surface to surface currents and wind action, while of the large surface on the lower or submerged part of the buoy, half may at any time offer resistance to the current motion, no matter in what direction the vein may turn.

Larger sizes were tried, but in this instance the results were not shown to be proportional to the addition of metal used.

For observation, a number of buoys of varying lengths were placed in the water together, at a point the exact location of which was known.

They were then allowed to drift, and were located later and collected when deemed necessary. In this case the referencing was done by the use of the sextant. Two angles were read from the buoy upon three objects—one of which was common to both angles—of known position; for instance, certain prominent towers or chimneys. These angles were then plotted on a plan and the buoys located.

This may be done when the buoys do not pass beyond the range of the shore, with good results. It also proved helpful in conducting these observations, to note the speed and direction of the wind, in relation to the movement of the buoys. These comparisons gave very interesting results.

The observations were carried on under the direction of Mr. F. W. Thorold, B.A.Sc., Assistant City Engineer.

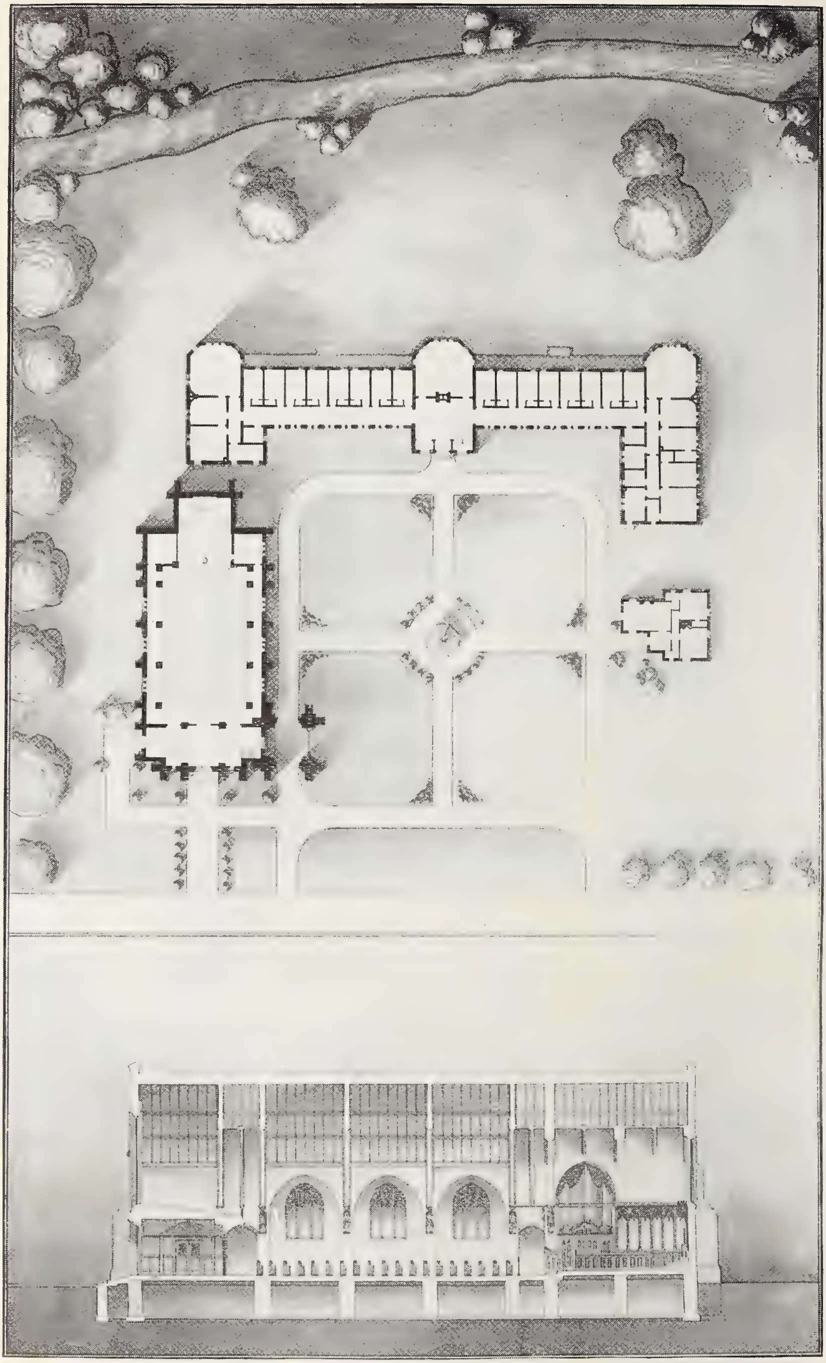
Record of Winds, 1908, Obtained From the Meterological Observatory.

	June.	July.	Aug	Dec.	Sept.	Oct.	Nov
N.	2	0	2	0	1	0	3
S.	12	1	0	0	0	0	0
E.	15	11	10	14	12	6	2
W.	1	19	16	13	19	24	19
Variable			2	2	3		1

1909.

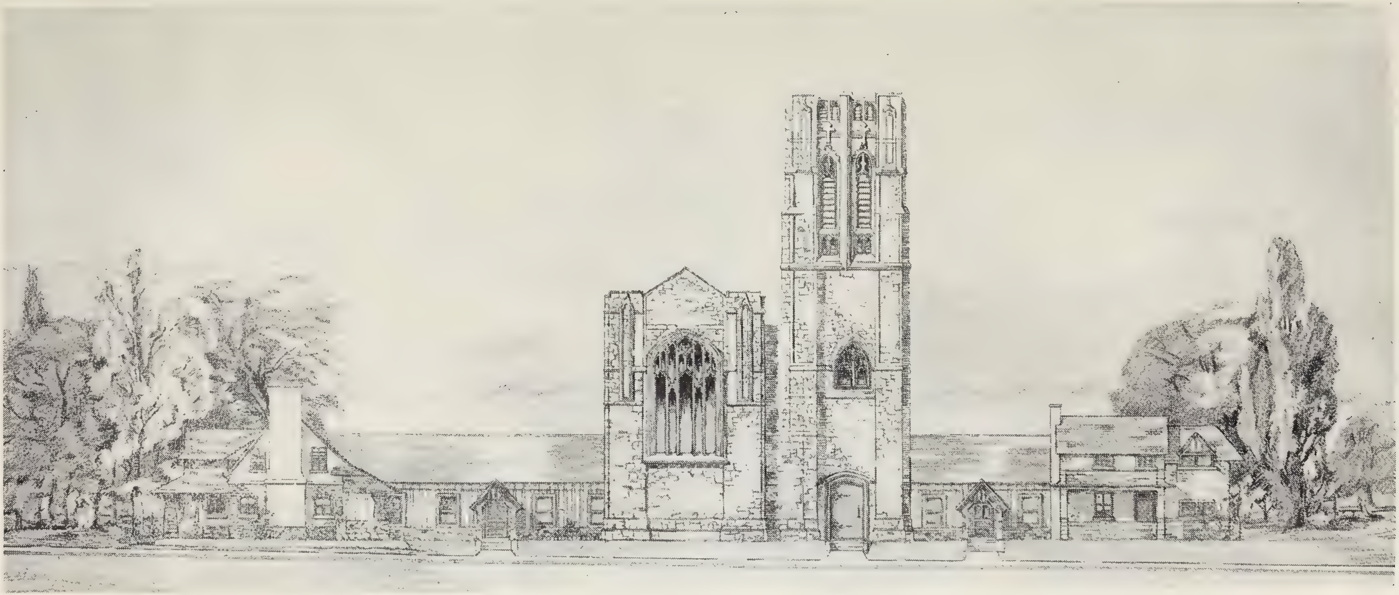
	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.
N.	7	3	11	4	1	0	1	1	1
S.	2	0	1	2	2	0	0	0	0
E.	4	5	6	11	12	10	10	12	11
W.	18	18	11	8	11	16	18	15	13
Variable		2	2	3	5	4	2	3	3

Of 485 days observed 50.5% were westerly.
" " " " 31.1% " easterly.
" " " " 7.6% " northerly.
" " " " 6.7% " variable.
" " " " 4.1% " southerly.

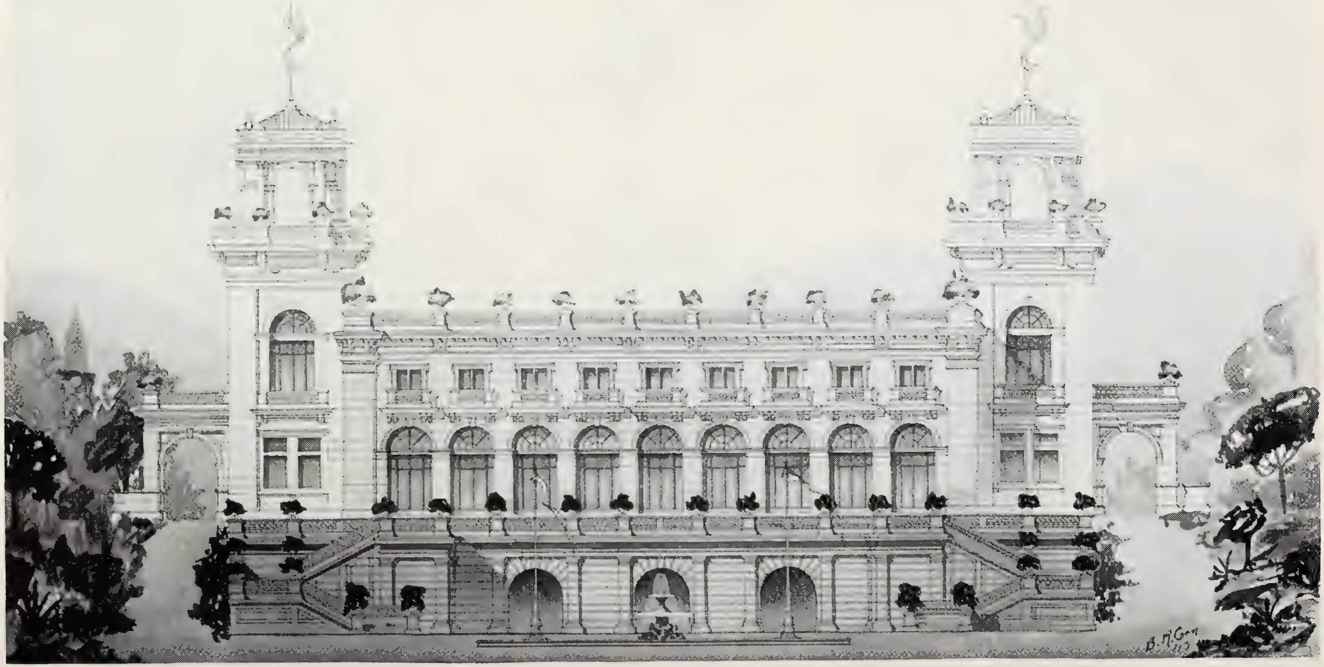


A HOME OF REST FOR AGED POOR, WITH DETACHED CHAPEL AND MANSE

Designed by T. L. Rowe, '11

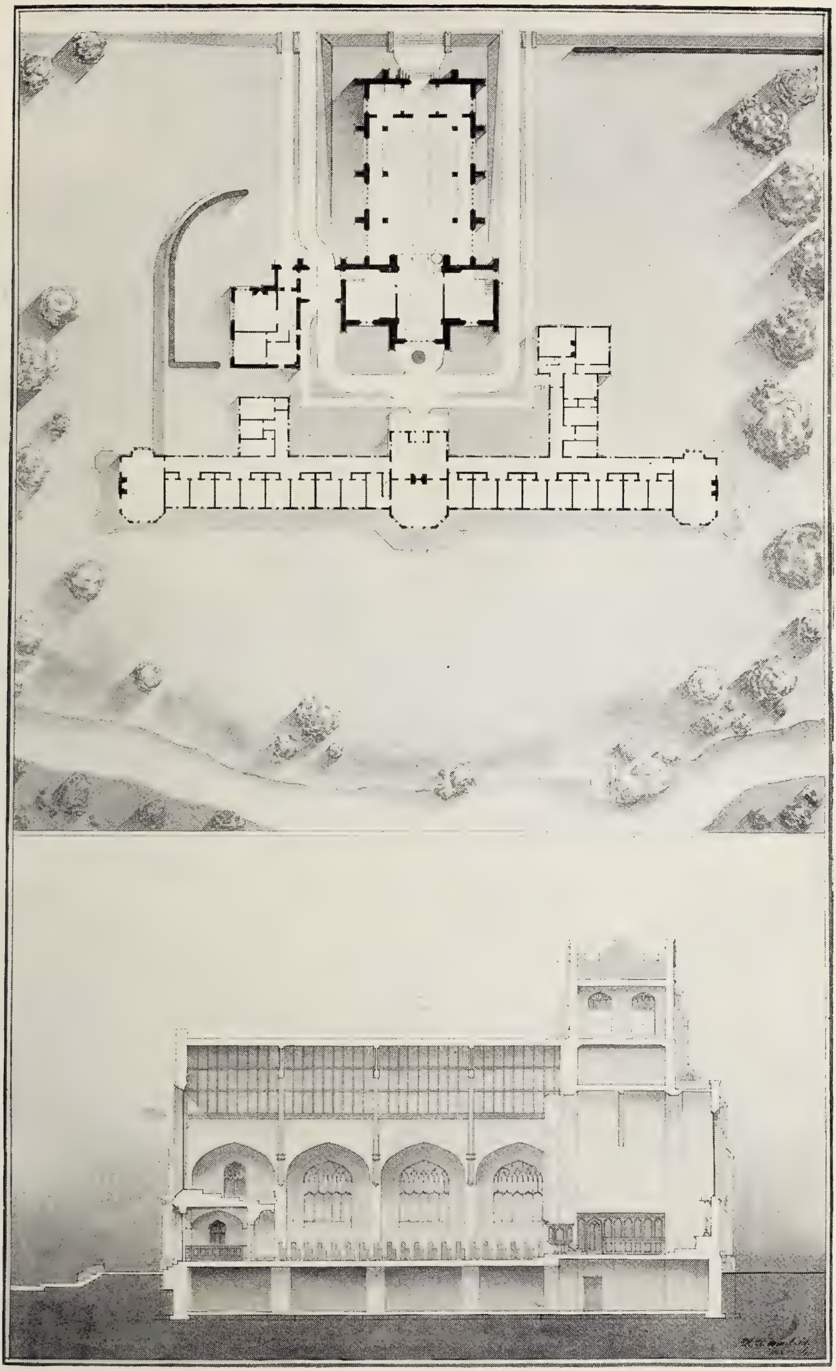


A HOME OF REST FOR THE AGED POOR, WITH DETACHED CHAPEL AND MANSE
Designed by Paul Sheard, '11

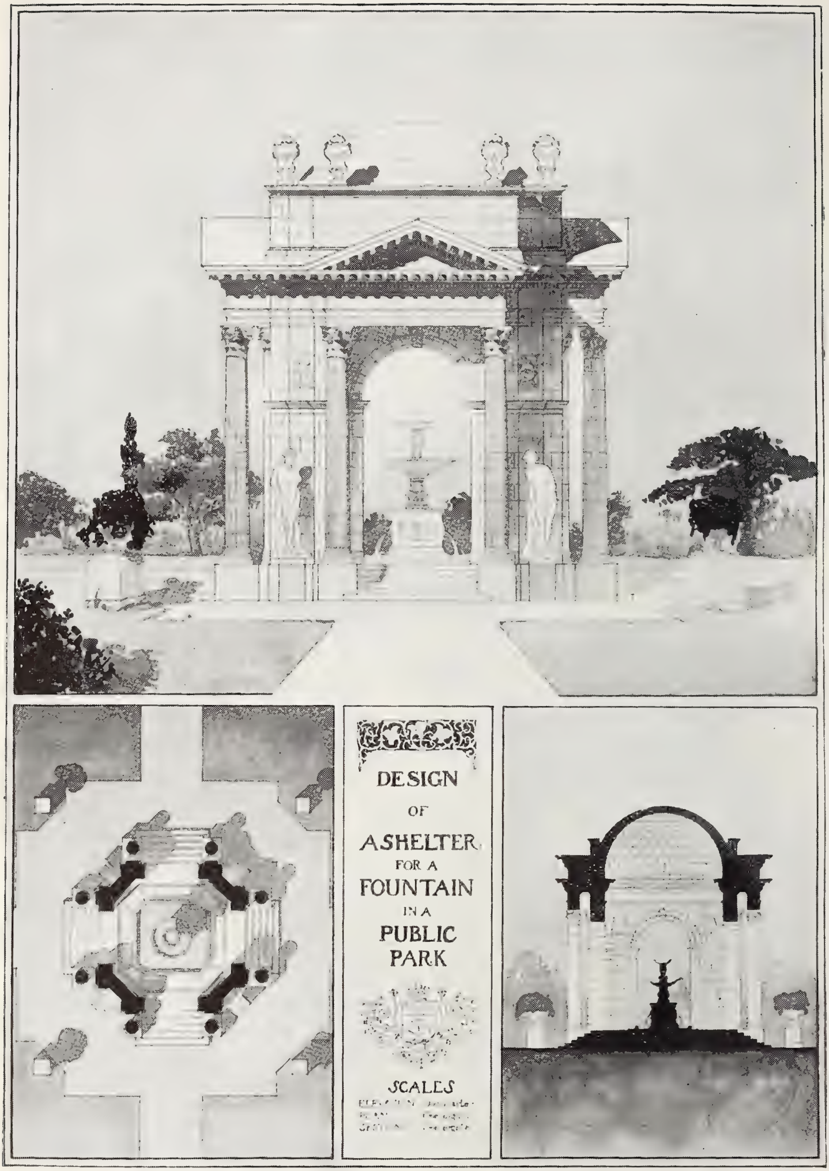


A RESTAURANT IN A PUBLIC PARK

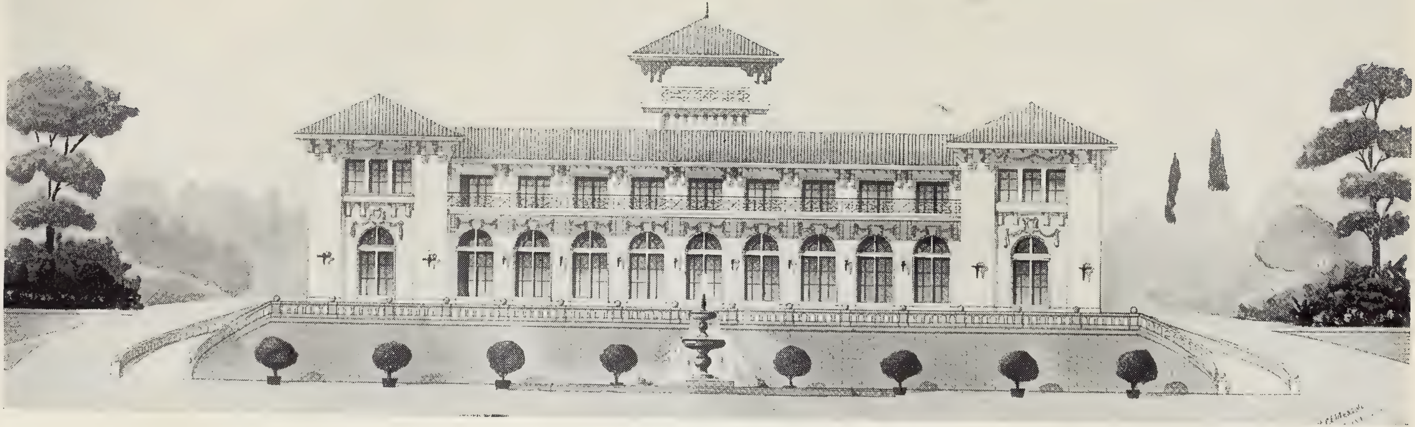
Designed by B. R. Coon. (Second Year Student)



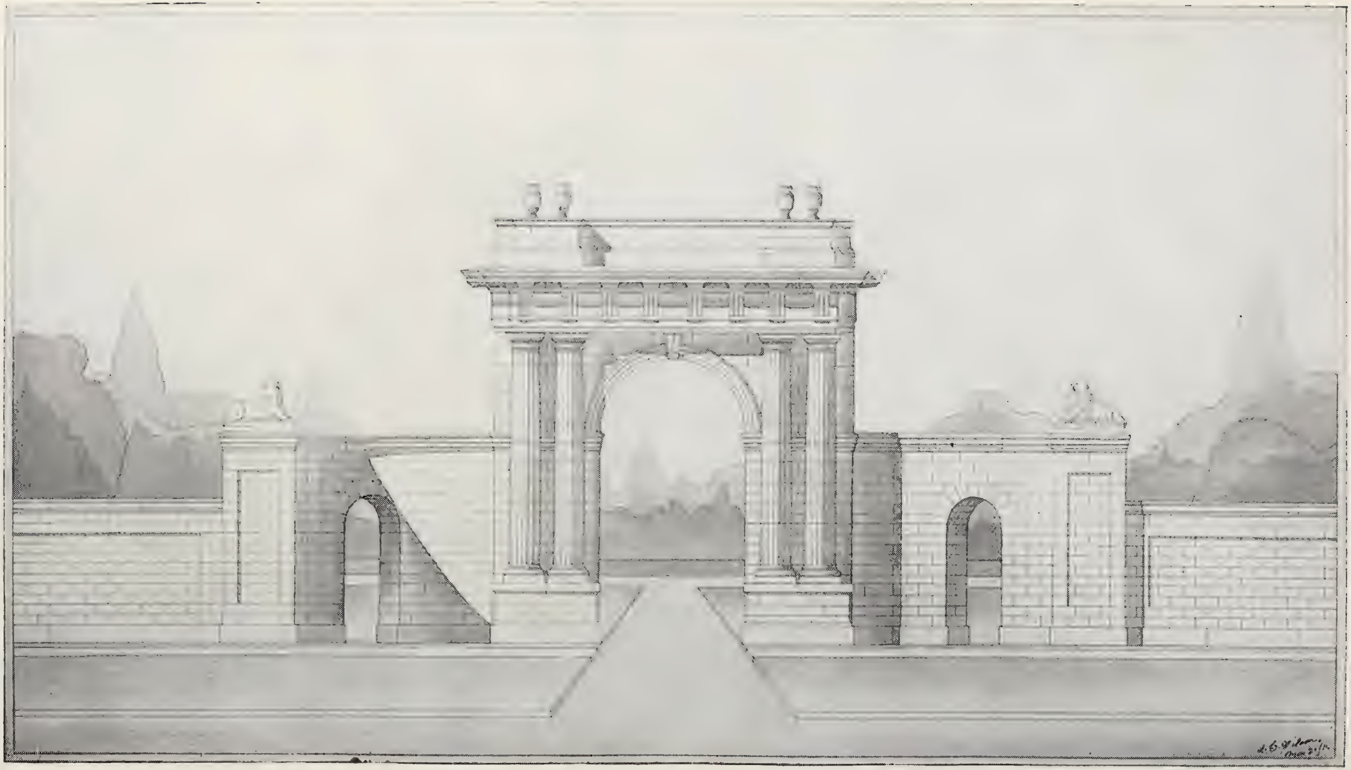
A HOME OF REST FOR AGED POOR, WITH DETACHED CHAPEL AND MANSE
Designed by H. H. Madill, '11



A SHELTER FOR A FOUNTAIN IN A PUBLIC PARK
Designed by R. S. McConnell. (Second Year Student)



A RESTAURANT IN A PUBLIC PARK
Designed by L. C. M. Baldwin. (Second Year Student)



A GATEWAY TO A RICH MAN'S ESTATE
Designed by A. C. Wilson. (First Year Student)

PENNSYLVANIA ELECTRIFICATION.

H. A. COOCH, B. A. Sc.

The problem of transportation in the city of New York is one which has puzzled the minds of the most talented and experienced engineers since 1871.

New York, of course, is so situated that either bridging or tunneling was necessary for a terminal station in the heart of the city.

In 1884 a proposition was discussed to build the "North River Bridge," with a span almost twice that of the Brooklyn Bridge, but due to the enormous cost both in property and construction, as well as the possible obstruction to navigation, it was abandoned.

The tunnel proposition under the North and East rivers was often considered, but was out of the question as far as steam locomotives were concerned.

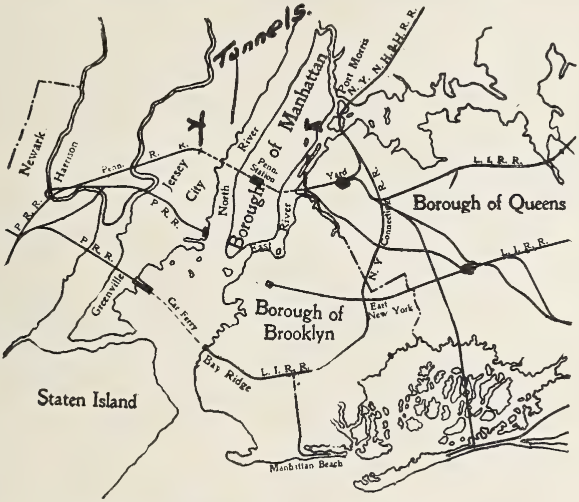


Fig. 1. Sketch of New York and Vicinity.

The successful development of the electric motor for traction purposes, first in quite small units, as applied to car axles, and during the past ten years in sizes so large, and capacity so great, as not only to equal, but in the case of the "Pennsylvania Locomotive," to exceed the power of any steam locomotive heretofore built, has solved the above problem.

The electrification is entirely of direct current, which, for a comparatively short mileage, compares very favorably with the single phase.

The length of track electrified is twenty miles, extending from Harrison, N. J., to Long Island City, about twelve miles being tunneled in all. This can be plainly seen by referring to Figure 1.

It has been estimated that the ratio between the coal burned for operating passenger trains by electric, and that for steam locomotives is 1 to 2, which seems to more than counterbalance the necessary initial outlay, while, as far as convenience and cleanliness of operation is concerned, electrical equipment is much more satisfactory.

Thus the Pennsylvania Railroad has fitted up one of the most elaborately and magnificently equipped terminal stations in the world. (Fig. 2.)

Altogether the operations around New York city have cost the railroad nearly $150,000,000.

The new station itself is located on 7th Avenue, between 33rd and 35th Streets, and is handy to all parts of the city.

At present the passenger traffic through the new station numbers about 500 trains per day, while the construction has been so made as to allow of a possible 1,000 per day. All the traffic, of course, with a few exceptions, which is handled by the new station, is passenger, the freight being taken across the river by car ferries from Greenville to Bay Ridge.

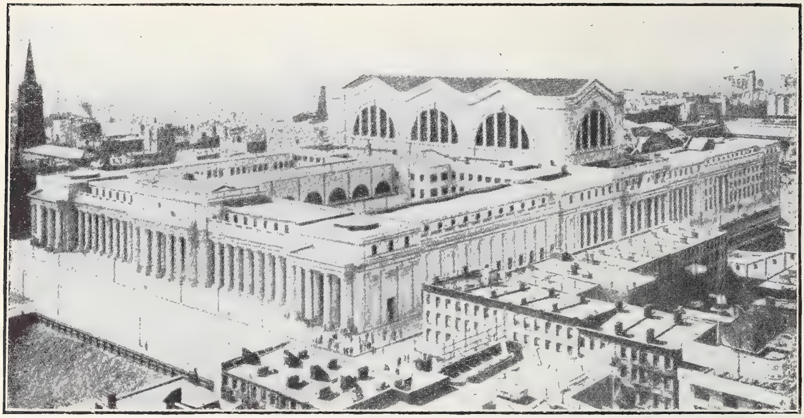


Fig. 2. Pennsylvania R. R. Terminal Station, New York City.

The locomotive itself (Fig. 3) is designed in two half units. The design of the articulation between them is such that the leading half serves as a leading truck, and the other half as a trailing truck for travel in either direction.

This type of locomotive has also a very peculiar method of drive, which distinguishes it from all others. Instead of the usual methods of drive, i.e., of gear wheels, as in ordinary street cars; quill drive, as in the case of the New York, New Haven and Hartford; or direct drive, as in the case of the New York Central type, connecting rods on the drivers are connected by cranks to the crank or eccentric on the motor, like ordinary steam locomotives. This arrangement can be quite clearly seen in Fig. 4.

The drivers are 72 in. in diameter, and the pony trucks 36 in. in diamteer. The total wheel base is 23 ft. 1 in. per half.

The weight of the locomotive completely equipped is 332,000 lbs., while the weight on the drivers is 207,800 lbs.

The motors (Fig. 5.), two of which are placed on each engine, are connected for series-parallel operation, but either motor can, without the aid of the other, run the engine should the occasion arise. Each unit is equipped with the Westinghouse electro-pneumatic system of multiple control, so that in a case of a particularly heavy load, as many locomotives as necessary can be used, each controlled by the master controller in the front cab of the leading engine.

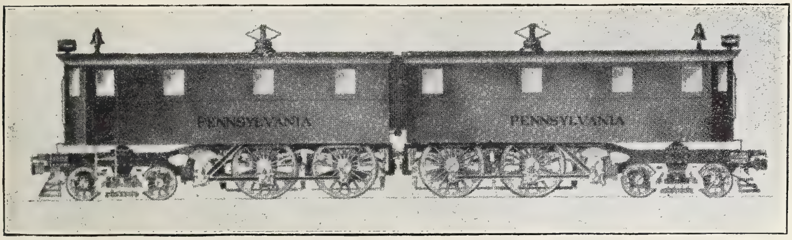


Fig. 3. Sketch of Pennsylvania Locomotive.

The location of the motors is high above the driving axles, which means that high speeds are possible on turning without any extreme stresses on the rails.

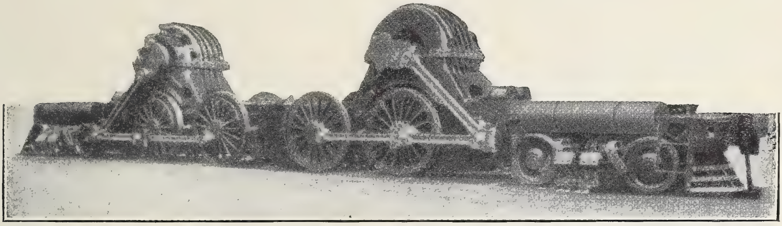


Fig. 4. General View of Running Gear.

With one motor alone the locomotive can exert a tractive effort of 30,000 pounds, the maximum possible tractive effort being 69,300 pounds, although 79,200 pounds have been developed.

The maximum capacity of the locomotive with the two motors is 4,000 h.p. for short periods, and 2,000 h.p. continuously.

The motors are designed to operate on 600 volts d.c., and each weighs 45,000 lbs.

The maximum speed obtainable is 95 miles per hour, and the maximum guaranteed speed is 80 miles per hour.

The motors themselves carry 2,900 amps., at 600 volts full load, and operate at an efficiency at this load of 92.1 per cent. They take their power from a protected third rail, and are also

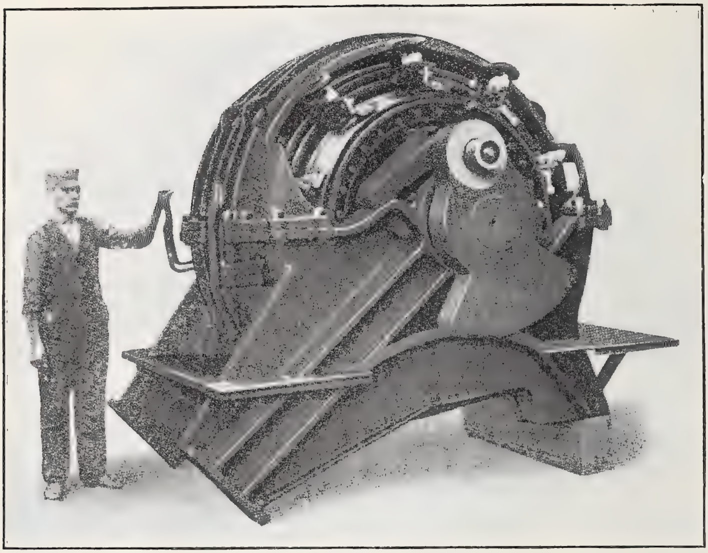


Fig. 5. Detail View of Motor.

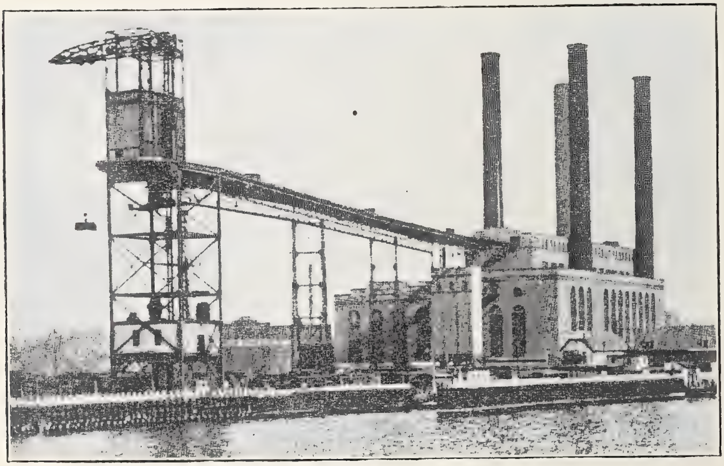


Fig. 6. Power Station, Pennsylvania Electrification.

connected to a pantagraph which, for safety purposes, is used together with an overhead construction in the case of railroad crossings too wide for the momentum of the train to carry them across at a reasonable speed.

The motors are provided with commutating poles, consequently have sparkless commutation, even when carrying the momentary heavy currents used in acceleration, which are far in excess of the normal running current of the motors.

Notwithstanding the good commutation resulting from the presence of auxiliary poles, provision is made to relieve the driving gear from the dangerous shocks that would result in the event of an accidental flash-over at the brushes. A flash-over practically stops the motor armature for an instant, and unless the shaft can slip in the armature core the effect on the driving gear would be disastrous.

This is prevented by a slip clutch between the armature core and its spider. The clutch can be set by means of the springs, so that slipping will start at any overload. In the case of most of the locomotives these clutches are set to slip at 100 p.c. overload, and consequently this renders the pins and connecting rods quite safe.

The power for operation of the trains is supplied from the power plant (Fig. 6), located at Long Island City. At present it has a capacity of 40,000 k.w. and is capable of an extension to 75,000 k.w.

The total number of locomotives used by the Pennsylvania is 24, the cost being about $50,000 apiece. These, together with 280 multiple unit cars, take care of all the present traffic.

OBITUARY.

Roy B. Ross.

The death, in far-away Buenos Ayres of Roy B. Ross, '05, a few months ago, lessened our number by one of the most promising young engineers of the Faculty of Applied Science has produced. He received his early education at Ingersoll, Ontario, and afterwards came to Toronto to reside, attending Toronto Junction High School. Mr. Ross entered upon his course in Engineering in 1900, and after completing two years became identified with the Otis Elevator Company of Yonkers, N.Y. In 1904 he resumed his course.

Roy B. Ross

After graduating with honors he became associated with Haney & Miller, in this city. Leaving their employ, he joined the International Marine Signal Co., in their Ottawa office. His engineering ability and ingenuity gained for him a position with the same firm in New York City a short time later. Then in 1909, Mr. Ross went for them to further their interests in Argentine Republic, where he remained until the spring of 1910. He spent the summer in his native city, Toronto, returning to Buenos Ayres, early last fall. It was in the south that his remarkable progress was checked and his early death, at the age of 26 years, occurred.

Mr. Ross was known and admired by every classmate for his congenial disposition and exemplary companionship, and his devotion to the ideals that characterize the successful engineer. In the crystallization of present into past, the personality of Roy B. Ross will long be remembered as a brilliant college man, and a man of promise. For those in Toronto, to whom the sad news of his death in strange and distant Argentine, came as a bolt from blue skies, we extend the sympathy of the class '05 and of the School.

H. Stanley Fierheller, B.A.Sc.

The Faculty of Applied Science lost one of the brightest of her younger members, and the School one of her most promising graduates in the early summer of 1910, when H. Stanley Fierheller passed away.

Stan. received his early training in Markham public schools and collegiate, and after obtaining the highest standing there became one of the most popular members of the class of '05.

Immediately after taking the degree of B.A.Sc., with honors, he joined the electrical department, taking charge of the lectures in electric circuits to the first year and the laboratory work of the fourth year. At the end of two years he obtained leave of absence and spent a year at research work, publishing at the end of the year an extended paper based upon his researches. He returned to the School in the fall of 1909, but ill-health forced him to resign.

H. Stanley Fierheller, B.A., Sc.

His work and his personality, as shown in the short time he was with us, will be a constant memorial to a real man.

Milton Thomas Culbert, B.A.Sc.

The death of Milton T. Culbert, on March 14th, removed from the engineering profession one of the cleverest men that the Canadian mining industry has ever known. Mr. Culbert was born in Granton, near London, Ontario, on May 29th, 1880. He received his public school training partly in Granton and finished in London, Ontario, where he passed his high school entrance in 1893, at the age of 13. He spent three years at the London Collegiate Institute, and left school to drift out to the foothills of the Rockies. The following summer he spent in Parry Sound, and while here visited the Calumet and Hecla, and the Bruce Mines, and took a deep interest in mining. Some of his mining friends persuaded him to take a mining course, to which his father readily consented. He passed his matriculation examination in 1898, and spent the next four years in the mining course of the School of Practical Science, graduating and taking his degree of B.A.Sc., both with honors.

Milton Thomas Culbert, B.A., Sc.

His first summer vacation was spent at Copper Cliff; the other three with Prof. Coleman on the geological survey of the Sudbury district. He also prepared the report on the Hutton Iron Range. In 1903-4 he was demonstrator in mineralogy and geology in the University of Toronto. In 1904 he compiled the map of the Sudbury Nickel Range. The following winter he went to the Western States for a short time, and spent some time in the refinery of the smelter at Trail, B.C. Hearing of the Cobalt find he came east again, and met Mr. M. J. O'Brien in the spring of 1905, and entering his service, proceeded to Cobalt, where he opened up and developed the O'Brien mine.

Mr. Culbert had always taken an active interest in the progress of the Faculty of Applied Science and Engineering. Since his taking up residence in the north country he has been at work on a collection of valuable ore specimens, which would have soon been complete, for presentation to the University. He was actively associated, also, in all that concerned the progress of the Cobalt and Temiskaming districts, being a member of the municipal council; a member of the council of the Cobalt branch of the Canadian Mining Institute; president of the Temiskaming Mine Managers' Association; and president of the Temiskaming S. P. S. Graduates' Club, as well as being prominent in Masonic and social circles.

His rapid advancement was checked by a fatal attack of appendicitis, and cut off death at the early age of 30 years.

The funeral in London was conducted under Masonic auspices, and was attended by a large delegation of mining and municipal men from the Cobalt district, showing the esteem and honor in which Mr. Culbert was held.

To Mrs. Culbert and her son, Milton, jr., and to Mr. Victor Culbert, B.A.Sc., '07, brother of the deceased, our heartfelt sympathy is extended.

PRESIDENT CAMPBELL'S RETIRING ADDRESS.

Gentlemen:—

This is the last time that I shall have the opportunity of addressing you as your president. I wish to thank each one of you for your hearty co-operation throughout my term of office.

The past year has seen the coming into effect of some important changes in the affairs of the Society, and with your permission I will review the work of the year.

The Society have had this year for the first time a secretary employed exclusively for its work. Mr. Irwin, who has occupied this position, has performed his duties as editor-in-chief of "Applied Science," and as manager of the supply department, in a manner highly satisfactory to the executive and to the members of the Society.

The supply department has had a record year. A permanent sales clerk has been employed there throughout the year. The new system of book-keeping has been used in this department as in the others. The policy here has been to extend the stock handled and to make only such profit as is necessary to meet the expenses of the Society. We would like again to draw the attention of the staff to the fact that should they desire to publish text books, covering any of the branches of our studies, the Society is now in the position financially to aid in the publication and distribution of such books.

Our monthly, "Applied Science," as you have heard from the editor's report, has had a good year. It continues to grow and promote more cordial relations between graduates and undergraduates, and we look forward to its being issued monthly throughout the year, rather than for but six months of the year, as at present. The monthly has done much to build up the feeling of "Boost for the School."

Our Annual Dinner was a success. At it we entertained officers and members of the Toronto Board of Trade, the chairman and some members of the Royal Commission on Technical Education, as well as representatives from the various educational institutions and technical societies and journals of the city.

A new social function was started this year by the Society. We held the first annual Science dance. The dance was a great success socially and financially, and the thanks of the Society are due to the committee in charge of it.

The papers read before the Society have been of interest and the meetings well attended. Speakers from Chicago, Montreal, and Ottawa, at the expense of considerable time and money, have come to Toronto to address us and to give us the benefit of their experiences. Good papers have been the rule, too, in the sectional meetings, and excursions arranged by the vice-presidents, assisted by the staff, have been attended with profit.

The most cordial relations have existed between the students and the staff, whom we have found always willing to aid in the advancement of the Society. Your thanks are especially due to Dean Galbraith, Prof. Wright, and to our representatives on the University Senate, Mr. E. A. James and Mr. C. H. Mitchell, for their aid in carrying out the work of the year.

One grievance we have, in the cramped condition of our reading room and library. Extension there would indeed be appreciated by our members. Some new engineering books have, however, been added to the central library and sub-libraries this year, and with the adoption of some system of indexed cataloging to make the books more available, we may have hopes for a solution of this trouble in the not too distant future.

I have had reason to congratulate myself on the very able executive with whom I have been associated in carrying on the affairs of our Society. To them belongs the credit for anything that has been accomplished this year. I commend to you for your approbation the members of that executive. I congratulate you on your choice for the coming year, and feel confident that under their guidance the Society's best interests will be advanced.

In conclusion, let me thank you for the honor you have done me, an honor which it has always been my honest endeavor to merit.

I take great pleasure in introducing to you your president-elect for 1910-11, Mr. A. W. McPherson.

THE TREASURER'S REPORT.

Toronto, April 1st, 1911.

Gentlemen—

I beg to submit my report as treasurer of the Engineering Society during the year 1910-11. The system of bookkeeping recommended by the auditor a year ago, and described in the revised edition of the Constitution, has been very satisfactory, enabling us at all times to have our financial affairs under easy supervision.

Through the medium of the Supply Department the Society ventured this year upon the publication of a number of booklets bearing upon courses of lectures. Among these were "Notes on Descriptive Geometry for the Third Year," by Mr. J. R. Cockburn; "Notes on Dynamics of Rotation," by Prof. W. J. Loudon; "Notes on the Chemistry of Fuels," by Dr. Ellis, and "Notes on the Calculus," by Mr. S. Beatty, the latter being a small textbook of some seventy pages. The department also began the sale of photographic supplies, and, in short, broadened out extensively to meet the needs of undergraduates.

Applied Science has, during the year, almost succeeded in refunding to the Society the $275 paid to the former editor last summer, this amount having been due him upon commission basis, and having been left over by the former executive. This has evidently been an exceedingly successful year for the monthly.

A summary of the business of the year appears herewith:

Cash Book Balance.

From April 1st, 1910, to April 1st, 1911.

RECEIPTS.

From 1909-10 Executive:	
Cash in Bank	$ 324.84
Cash in Till	28.50
Deficit of Cash	2.29
Merchandise Sales	7,563.68
Applied Science	1,377.72
Fees	748.00
Annual Dinner	509.65
Annual Dance	40.75
Telephones	49.75
Outstanding Cheques, March 31st, 1911	440.08
	$11,085.26

DISBURSEMENTS.

To 1911-12 Executive—	
Cash in Bank	$ 344.09

Forward $	344.09
Cash in Till	417.49
Applied Science	2,011.24
Supply Department—	
Merchandise	5,513.31
Salaries	966.33
Meetings and Entertainment	229.55
Annual Dinner	715.06
Sundry Expenses	700.44
Telephones	187.75
	$11,085.26

Balance Sheet.

RESOURCES.

Merchandise, as per inventory Mar. 31, 1911	$1,676.05
Cash on Hand	417.94
Cash in Bank	344.09
Accounts Due Supply Department	70.66
Accounts Due Applied Science	1,078.98
Fees Outstanding	70.00
Dinner Deposits	40.00
Office Equipment less 10 p.c. depreciation	212.85
	$3,910.57

LIABILITIES.

Accounts Outstanding Applied Science	2.52
Accounts Outstanding Supply Department	91.11
	93.63
Surplus	3,816.94
	$3,910.57

Surplus March 31st, 1911	$3,816.94
Surplus March 31st, 1910	2,862.48
Net Gain for Year	$ 954.46

Respectfully submitted,

M. B. WATSON,

Treasurer.

APPLIED SCIENCE

INCORPORATED WITH

Transactions of the University of Toronto Engineering Society

DEVOTED TO THE INTERESTS OF ENGINEERING, ARCHITECTURE
AND APPLIED CHEMISTRY AT THE UNIVERSITY OF TORONTO.

Published monthly during the College year by the University of Toronto Engineering Society

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EDITORIAL

Volume IV.
Number 6.

The April issue of "Applied Science" appears again as a reminder to the Alumni that the term is at its close. The undergraduate readers beg to be excused from being included within the range of such a warning. They need it not; with them the remaining hours are numbered. As to the trial balance that the month of April is striking for them at present, and likewise, to the fulness of the coming vacation "Applied Science" concurs with them in their anticipations and hopes.

In Volume IV. there appears to the editor a goodly number of deficiencies in the make-up of the Journal. Many of them, six months ago, seemed so easy to dodge. Like the undergraduate, he has "hopes," and these are that the shortcomings have not all bared themselves under the eye of publicity, and that the publication, as a whole, is not the standard by which the Alumni measure the particular branch of the University of Toronto in which they are most interested.

The Faculty.

The Faculty of Applied Science and Engineering has, like the monthly, shown but little outward evidence of material progress over last year. No new buildings have been added. The old red brick, under the name of Engineering Building, still adorns the southern border of the campus. In fact, to the daily passer-by, everything seems the same, except for the quaking upheaval that is slowly slicing the grounds to the north and south, with a view to producing heat and light from the direction of the ravine.

But within doors the year has been one of the most progressive. Each of the seven courses of instruction has made good progress in establishing better working foundation and broader scope, and in every department there appears to be at present the desired combination of the old fundamental principles with and by methods that are the most modern and best established. We do not know whether or not this was the policy laid down a year ago, but, at all events, it has made itself strongly known.

List of Graduates.

When the copy is closed, this number, enlarged to nearly twice its usual size, has the proportions which it is to be hoped it will attain within the next few years. We trust that upon opening it and glancing through, the reader will not find disappointment in the cause of the increase in the number of pages. The contained list of graduates is taken directly from the Calendar for 1911-12, that is now on the press. Its publication here will give the members of the classes of '05 and '95 and '85 an idea of the expansion and of the result of the early and unceasing efforts of the men to whom this expansion can readily be traced. It will give classmates the addresses of their classmates, and will give all to understand that "back home" their names and present professional capacities are on record. We ask each one to aid us in keeping this record as up-to-date as possible. This only requires the mailing of a postcard to inform us of any change of address. Professional news of the graduates is also very much appreciated.

Architectural.

The appearance in this issue of further examples of work done in the Department of Architecture need not be explained. The illustrations speak for themselves. That this course in the University of Toronto has been making rapid advancement is the word left by leading architects who have visited it recently. These men being qualified to judge by the correct standards of the present, their approval bears considerable weight.

The few examples of design shown here are supplementary to those which appeared in the February issue, and are indicative of the work done in the four years of the course.

S. P. S. Club in Montreal.

There are approximately two dozen of our graduates in Montreal. The number increases yearly, and, during the summer months, is nearly twice as large, owing to the presence in that city of many of our undergraduates. Just at present there is some little talk of an S. P. S. Club being formed. The enterprise would undoubtedly succeed. The clubs in New York and Pittsburg are extremely well founded and well recognized. The S. P. S. Temiskaming Club is an energetic organization, that does not hesitate at inadequacies of location or environment. It has been an important pillar in the progress of the Cobalt region, and the credit is due to the enthusiasm and efforts of the late Mr. Culbert and his colleagues.

In Montreal there are men of the old "School," who have kept in touch with us as well as their opportunities would permit. There are men, too, of the most recent classes, and men of the years between. A few of them have been in close relations with the Faculty of Applied Science, knowing its accomplishments, obstacles, and requirements. In all, there is a find of subjects for discussion concerning the old "School" which, in addition to the current engineering topics, would create sufficient interest to assure the success of an organization meeting.

We would be glad to hear of such a worthy step being taken.

The Employment Bureau.

On another page appears a word from the Secretary of the Faculty in the interests of the employment bureau. That this department is receiving ample recognition from engineers and manufacturers is evidenced by the fact that at no time during the past year were names of applicants for positions on file for any lengthy period. Oftentimes, solicitations for men from manufacturing firms could not be met. We feel that to the Alumni is due no little credit for this favorable condition of affairs.

Just at present, however, the bureau is besieged with applicants for work—men who, in the press of preparation for examinations, have been unable to make their own arrangements for the coming summer. Any information, therefore, that the graduate readers of Applied Science may be able to give in the placing of these men during the next fortnight or month, or that will in any way alleviate the burden upon the employment bureau, will be very much appreciated, especially by the undergraduates themselves.

C. Cooper, '99, is engaged at Keokuk, Iowa, with the Keokuk and Hamilton Water Power Company.

J. Hemphill, '09, who for the past two years has been in the employ of the Lake Superior Corporation at Sault Ste. Marie, has accepted a position with the Canton Electrical Company, of Canton, Ohio.

PROFESSOR HAULTAIN AT THE DINNER OF THE UNIVERSITY OF TORONTO CLUB OF NEW YORK.

The annual dinner of the University of Toronto Club of New York was held in the Engineers' Club on February 18th. Dr. Reeve, ex-Dean of the Faculty of Medicine, and Professor Haultain were the guests from Toronto.

In his speech Professor Haultain explained that he had not yet been completely absorbed into the academic life; that in many things he still felt very much as an outside graduate, still feeling his way in his new environment. He expressed his appreciation of being a member of the Faculty of Applied Science and Engineering, and touched on matters of University organization from the point of view of the newcomer. After an expression of a very warm appreciation of Dean Galbraith* he spoke in part as follows.

"This morning I had the good fortune to meet one of the prominent members of the Board of Trustees of Columbia University. This Board of Trustees largely combine the functions of our Board of Governors and of our Senate. I told him of my impending speech this evening, and asked him for a word. He said: 'Tell them this; the best thing Columbia ever did was when they put Alumni representatives on the Board of Trustees.'

"Now, as you are aware, representatives of the Alumni, chosen by the Alumni, sit on our Senate. The Senate is a part of the University to which I have not yet penetrated. The other professors, in Arts, and Applied Science and Engineering, have a seat there, but the department of Mining Engineering is not represented. They tell me it is an august body, and is venerated as such. As far as the Engineering Faculty is concerned, its confidence in our Faculty Council seems to leave it without further function than that of confirming our actions. It has the steadying effect of an upper house, but the real work of organization and of progress is done in our own Faculty Council, dependent always, of course, upon the Board of Governors, who hold the purse strings. Here is where the graduates should be, on the Faculty Council and on the Board of Governors. In connection with this there is one thing that has been impressed upon me very strongly in my academic work. I was aware of it when I entered, and it has been impressed upon me at every turn since. The academic work is and must be very different from the field work. There are certain things in which they approach, in all things the one must be governed by the needs of the other, but they are and must remain inherently different. The corollary to this is: The graduate who would be of much service to the University must be in close touch with things academic. The place for him is in the heart of things, the Faculty Council. An irresponsible man, a man who jumped to conclusions without careful study, might do very much harm in such a position, as he would in any other delicate position, but the graduates can be depended upon to choose good men. I would leave an idea with you—an idea that I would fain enlarge upon, did time permit. A graduate on the Faculty Council or on the Board of Governors might have a very valuable catalytic action. There might be more in the results he brought about between others than in what he did himself."

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*See University Monthly, April, 1911

WHAT OUR GRADUATES ARE DOING.

H. F. Shearer, '08, formerly with the Allis Chalmers Company in Cincinnati, is with Smith, Kerry and Chace, in their Toronto office.

H. J. Acres, '03, is with the Hydro-Electric Power Commission, with headquarters in Toronto.

R. E. McArthur, '00, is in the construction department of the Canadian Pacific Railway in Montreal.

W. F. Stubbs, '05, is with the Trussed Concrete Steel Company, Walkerville, Ontario.

P. M. Thompson, '07, is in the employ of the American Bridge Company at Ambridge, Pa.

Chas. Flint, '08, is with the MacDonald Engineering Company, of Chicago.

C. Johnston, '06, is district engineer for the Canadian Northern Railway, with headquarters in Toronto.

T. J. McFarlen, '93, is with the Atikokan Iron Company, Port Arthur, Ontario.

Chester B Hamilton, jr., B A.Sc., '06, is managing a new firm under the name of the Hamilton Gear and Machine Co., which will specialize in cut gears. The factory will be located at the corner of Concord and Van Horne Ave.

D. J. Miller, '10, is connected with the Alberta Central Railway, at Red Deer, Alta.

G. H. Richardson, '88, is in Edmonton, Alta., with the Yellowhead Pass Coal and Coke Company.

S. B. Code, '04, is town engineer of Smith Falls.

W. M. Currie, '04, is managing director, Canada Steel Co. Ltd., Hamilton.

Geo. Hogarth, '09, is assistant engineer, Dept. of Public Works, Parliament Buildings, City.

F. C. Jackson, '01, is in partnership at La Tukue, Quebec, under the name of Jackson and Connolly, contractors.

A. W. Lamont, '09, is sales engineer with the Canadian Westinghouse Co., Ltd., in their Winnipeg office .

E. W. Kay, '07, is in the sales department of the Canadian Westinghouse Company, Winnipeg.

C. S. Dundass, '06, is in Lachine, Quebec, with the Dominion Bridge Company.

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LIST

OF

GRADUATES

AND THEIR

BUSINESS ADDRESSES

APPLIED SCIENCE
APRIL, 1911

GRADUATES.

Graduates are requested to inform the Secretary of changes in their addresses.

1881.

1. J. L. MORRIS, C.E., O.L.S. *Morris and Moore Land Surveyors and Architects.*	Pembroke, Ont.

1882.

1. D. Jeffrey *Contractor.*	Windsor, Missouri.
1. J. H. Kennedy, C.E., O.L.S., *Chief Engineer, Great Northern Ry.*	Vancouver, B.C.
1. J MCAREE, B.A.Sc., D.T.S. (Deceased.)	

1883.

1. D. Burns, O.L.S., A.M., Can. Soc. C.E., *Instructor in Mathematics and Plan Drawing, Carnegie Technical Schools.*	Pittsburgh, Pa.
1. G. H. DUGGAN, M. Can. Soc. C.E., *Dominion Coal Co., Ltd.*	Glace Bay, N.S.
1. J. W. TYRRELL, C. E., D.L.S., *Tyrrell & MacKay, Consulting Engineers and Surveyors.*	Hamilton, Ont.

1884.

1. W. C. KIRKLAND, *Principal Assistant Engineer, Drainage, Sewage and Water Board of New Orleans.*	New Orleans, La.
1. J. MCDOUGALL, B.A. (Deceased.)	
1. A. R. Raymer, *Assistant Chief Engineer, P. & L. E. Ry.*	Pittsburgh, Pa.
1. JAMES ROBERTSON, O.L.S., *Commissioner, The Canada Co.*	Toronto, Ont.
1. E. W. STERN, M. Am. Soc. C.E., *Consulting Civil Engineer.*	103 Park Ave., New York.

1885.

1. J. F. BLEAKLEY, *Civil Engineer.*	Bowmanville, Ont.
1. H. J. BOWMAN, D. & O.L.S., M. Can. Soc. C.E., *Bowman & Connor.*	Berlin, Ont.
1. E. E. HENDERSON, O.L.S., *Civil Engineer.*	Henderson, P.O., Me
1. B. A. LUDGATE, O.L.S., *Assistant Engineer, P. & L. E. Ry.*	Pittsburgh, Pa.
1. O. MCKAY, O.L.S., *Civil Engineer and Surveyor.*	Walkerville, Ont.

1886.

1. A. M. BOWMAN, D.L.S., Pittsburgh, Pa.
Pennsylvania Contracting Co.

1. E. B. HERMON, D. & O.L.S., Vancouver, B.C.
Assistant Engineer Vancouver Power Co.

1. ROBERT LAIRD, O.L.S., Haileybury, Ont.
Laird & Routly, Engineers and Surveyors.

1. T. KENNARD THOMSON, C.E., M. Can. Soc. C.E., M. Am. Soc. C.E.,
Hudson Terminal Building, New York.
Consulting Engineer.

1. H. G. TYRRELL, C.E., A.M. Can. Soc. C.E., 2151 Fulton Ave., Cin., Ohio.
Chief Engineer, The Brackett Bridge Co.

1887.

1. J. C. Burns (deceased.)

1. A. E. LOTT, Los Angeles, Cal.
Consulting Railway Engineer, 441 Bradbury Building.

1. A. L. MCCULLOUGH, O.L.S., B.C.L.S., A.M. Can. Soc. C.E., Nelson, B.C.
Engineer and Surveyor.

1. F. MARTIN, M.B., O.LS.,
Physician.

1. C. H. PINHEY, D. & O.L.S., 110 Wellington St., Ottawa, Ont.

1. J. ROGERS, O.L.S., Mitchell, Ont.
Town Engineer.

1888.

1. J. F. APSEY, O.L.S., 3205 Wallbrook Ave., Baltimore, Md.
Assistant Divison Engineer, Baltimore Sewerage Commission.

1. W. T. ASHBRIDGE, C.E., 1444 Queen St. E., Toronto, Ont.
Engineer and Surveyor.

1. EDWARD F. BALL, A.M. Can. Soc. C.E. ,
335 Madison Ave., New York, N.Y.
Chief Assistant Engineer, Land and Tax Department, N. Y. Central & Hudson River Railroad.

1. D. B. BROWN, O.L.S., Quebec, P.Q.
Locating Engineer, Transcontinental Ry. (G.T.P.)

1. C. M. CANNIFF, Toronto, Ont.
Fielding & Canniff Co., Consulting Engineers.

1. H. J. CHEWETT, B.A.Sc., C.E., A.M. Can. Soc. C.E.,
Manning Arcade, Toronto, Ont.
Mechanical Engineer, Evans Rotary Engine Co., Ltd.

1. J. GIBBONS, D. & O.L.S., Ottawa, Ont.
Surveying Staff, Department of Interior.

1. R. MCDOWALL, O.L.S., C.E.,, A.M. Can. Soc. C.E.,
Town Engineer. Owen Sound, Ont.

1. G. W. MCFARLEN, O.L.S., Toronto, Ont.
City Engineer's Staff.

1. C. J. MARANI, Anacortes, Wash.
Designing and Consulting Structural Engineer for the Russia Cement Co

1. G. R. MICKLE, B.A., Toronto, Ont.
Mine Assessor, Province of Ontario.

1888—*Continued.*

1. J. H. MOORE, O.L.S., Smith's Falls, Ont.
Town Engineer.

1. G. H. RICHARDSON, Edmonton, Alta.
Managing Director Yellowhead Pass Coal & Coke Co.

1. K. ROSE, Curry Bldg., Toronto.
Manager, Evans Rotary Engine Co. of Canada.

1. J. E. ROSS, D. & O.L.S, Kamloops, B.C.
Surveying Staff, Department of Interior.

1. C. H. C. WRIGHT, B.A.Sc., Toronto, Ont.
Professor of Architecture, University of Toronto.

1889.

1. B. CAREY, Toronto, Ont.

1. W. J. CHALMERS, Pittsburgh, Pa.
With Vanport Beaver Co.

1. W. A. CLEMENT, M. Can. Soc. C.E., Vancouver, B.C.
City Engineer.

1. G. F. HANNING, Toronto, Ont.

1. H. E. T. HAULTAIN, C.E., M. Can. Soc. C.E., Toronto, Cnt.
Professor of Mining Engineering, University of Toronto.

1. J. IRVINE, Vancouver, B.C.
Locating Engineer, C.N.R.

1. D. D. JAMES, B.A., B.A.Sc., 227 George St., Toronto.
Surveyor.

1. F. X. MILL, (deceased.)

1. H. K. MOBERLEY, D. & S.L.S., Moosomin, Sask.
District Engineer and Surveyor.

1. T. R. ROSEBRUGH, M.A. Toronto, Ont.
Professor of Electrical Engineering, University of Toronto.

1. T. WICKETT, M.D., 362 Cannon St. E., Hamilton, Ont.
Physician.

1890.

5. W. E. BOUSTEAD, (deceased).

1. F. M. BOWMAN, O.L.S., C.E., Pittsburgh, Pa.
Secretary & Structural Engineer, Riter-Conley Mfg. Co

1. M. A. BUCKE, M.E. (deceased).

1. G. D. CORRIGAN, (deceased).

1. J. A. DUFF, B.A., (deceased).

1. A. B. ENGLISH, (deceased).

1. N. L. GARLAND 76 Wellington St. W., Toronto, Ont.

1. J. HUTCHEON, O.L.S., Guelph, Ont.
Engineer and Surveyor.

1. W. L. INNES, O.L.S., C.E., Simcoe, Ont.
Manager, Dominion Canners, Ltd.

1. E. B. MERRILL, B.A., B.A.Sc., M. Can. Soc. C.E., M. Am. Inst. E.E. Toronto, Ont.
Consulting Engineer, Toronto General Trusts Building.

1890—*Continued.*

1. J. R. Pedder (deceased).
3. R. A. Ross, E.E. 80 St. Francois Xavier St., Montreal, Que.
Ross & Holgate, Consulting Electrical and Mechanical Engineers.
1. T. H. Wiggins, O.L.S., Saskatoon, Sask.
Civil Engineer and Dom. Land Surveyor.
1. W. J. Withrow, Ottawa, Ont.
Patent Examiner, Patent Office.

1891.

1. H. J. Beatty, O.L.S., Eganville, Ont.
Engineer and Surveyor.
1. T. R. Deacon, O.L.S., M. Can. Soc. C.E., Winnipeg, Man.
President and General Manager, Manitoba Bridge & Iron Works, Ltd.
1. C. W. Dill, M. Can. Soc. C.E., Toronto, Ont.
C. *W. Dill & Co., Civil Engineers and Contractors, 318 Continental Life Building.*
5. O. S. James, B.A.Sc., 227 George St., Toronto, Ont.
1. A. Lane (deceased).
1. J. E. McAllister, B.A.Sc., C.E., Greenwood. B,C.
Manager, British Columbia Copper Co., Ltd.
3. E. B. Merrill, B.A., B.A.Sc., M. Can. Soc. C.E., M. Am. Inst. E.E. Toronto, Ont.
Consulting Engineer, Toronto General Trusts Building.
1. J. E. A. Moore, C.E., 10074 Kee Mar Court, Cleveland, O.
Consulting and Contracting Engineer.
1. W. Newman, O.L.S., A.M. Can. Soc. C.E., Windsor, Ont.
Consulting Engineer.
1. J.K. Robinson (deceased).
1. W. B. Russel, 318 Continental Life Bldg., Toronto, Ont.
Civil Engineer and Contractor.
1. G. E. Silvester, O.L.S., M. Am. Inst. M.E., Copper Cliff, Ont.
Chief Engineer, Canadian Copper Co.
1. H. D. Symmes, Niagara Falls S., Ont.
Engineer and Contractor.

1892.

1. J. R. Allan, O.L.S., Macleod, Alta.
Ranchman.
1. T. H. Alison, B.A.Sc., C.E., Bayonne, N.J.
Secretary and Chief Engineer, Bergen Point Iron Works.
1. A. G. Anderson, Port Dover, Ont.
Hardware Merchant.
1. C. Fairchild, D. & O.L.S., Brantford, Ont.
Surveying Staff, Department of Interior.
1. J. B. Goodwin, B.A.Sc., Gasport, N.Y.
Superintendent of Construction, Empire Eng. Corporation of New York.
4. C. E. Langley, Continental Life Bldg., Toronto, Ont.
Langley & Howland, Architects.

1892—*Continued.*

1. A. T. Laing, B.A.Sc., Toronto, Ont.
Secretary, Faculty of Applied Science, University of Toronto.

1. E. J. Laschinger, B.A.Sc., M.E., Johannesburg, Transvaal, S.A.
Mechanical Engineer, H. Eckstein & Co.

5. W. L. Lawson, B.A.Sc, Stirling, Col.
Manager, Stirling Brush & Fort Morgan Co.

3. W. A. Lee, B.A.Sc. (deceased).

1. B. McEntee, B.A.Sc., 28 Queen St. E., Toronto.
Stationer.

3. C. G. Milne, B.A.Sc. (deceased).

1. Chas. H. Mitchell, B.A.Sc., C.E., M. Can. Soc. C.E., M. Am. Soc. C.E.
Consulting Hydro-Electric Engineer, Trader's Bank Bldg., Toronto.

1. N. L. Playfair, Midland, Ont.
Superintendent Playfair Lumber Co.

1. J. M. Prentice (deceased).

1. J. A. Ross, Cleveland, Ohio.
Designer L. S. & M. S. Railway, Engineering Office.

1. Albert N. Smith, Youngstown, Ohio.
Engineer, Wm. B. Pollock Co.

1. R. W. Thomson, B.A.Sc., M.E., 4 Charles St., Toronto, Ont.
Mining Engineer.

3. A. V. White, M.E., Toronto, Ont.
Mechanical Engineer.

1893.

1. A. G. Ardagh, Barrie, Ont.
Land Surveyor and Civil Engineer.

.*H. F. Ballantyne, B.A.Sc., 244 Fifth Ave., New York, N.Y.
Architect.

1. G. L. Brown, O.L.S., A.M. Can. Soc. C.E., Morrisburg, Ont.
Civil Engineer and Land Surveyor.

1.*L. C. Charlesworth, D.L.S., Edmonton, Alta.
Director of Surveys for Alberta.

1. T. H. Dunn, O.L.S. Winchester, Ont.
Engineer and Surveyor.

1. J. M. R. Fairbairn, P.L.S., Westmount, Que.
Assistant Engineer, C.P.R.

4.*W. Fingland, 334 Portage Ave., Winnipeg, Man.
Architect and Structural Engineer.

1. C. Forrester Toronto, Ont.

1.*Walter J. Francis, C.E., M. Can. Soc. C.E., M. Am. Soc. C.E. Montreal, Que.
Consulting Engineer, 28 Commercial Union Building.

3.*A. R. Goldie, Galt, Ont.
Manager, Goldie & McCulloch Co.

3. S. C. Hanly, Midland, Ont.
Midland Engine Works Co.

4.*J. Keele, B.A.Sc., Ottawa, Ont.
Geological Survey of Canada.

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*Diploma with honours.

1893—*Continued.*

1. J. T. LAIDLAW, B.A.Sc., M.E., Cranbrook, B.C.
Consulting Mining Engineer.

3. F. L. LASH, Bandoeng, Java.
Manager, Electrical Supply Co., Board of Trade Building.

1. A. L. MCALLISTER, B.A.Sc., 612 Continental Life Bldg., Toronto, Ont.
Consulting Engineer.

1. T. J. MCFARLEN, 80 Waverley Rd., Toronto, Ont.
Chemist.

1.*A. J. MCPHERSON, B.A.Sc., D.L.S., Regina, Sask.
Superintendent of Highways, Province of Saskatchewan.

1. A. F. MACALLUM, B.A.Sc., C.E., Hamilton, Ont.
City Engineer.

1. W. T. MAIN, Wells St. Depot, Chicago, Ill.
Division Engineer, C. &. N. W. Ry.

1. V. G. MARANI, Cleveland, Ohio.
City Building Inspector, City Hall.

1. W. MINES, B.A.Sc., Cleveland, Ohio.
With Brown Hoisting Co.

3.*J. M. ROBERTSON, Montreal, P.Q.
Superintendent Repair and Testing Department, Montreal Light, Heat and Power Co.

1. R. RUSSELL, Pembroke, Ont.
Railway Contractor.

1.*F. N. SPELLER, B.A. Sc., Pittsburgh, Pa.
Metallurgical Engineer, National Tube Co.

1. R. H. SQUIRE, B.A. Sc., O.L.S (deceased).

1. W. V. TAYLOR, O.L.S., A.M.Can. Soc. C.E., Quebec, P.Q.
Quebec Harbour Commissioners.

1.*R. B. WATSON, Regina, Sask.
Department of Public Works.

1894.

3.*R. W. ANGUS, B.A.Sc., Toronto, Ont.
Professor of Mechanical Engineering, University of Toronto.

1. H. F. BARKER, Box 31, Halifax, N.S.

1. A. T. BEAUREGARD, B.A.Sc., East Orange, N.J.
Laboratory Engineer, Public Service Corporation of New Jersey.

1. A. E. BERGEY, Pittsburgh, Pa.
Carnegie Technical School.

3. D. G. BOYD, Toronto, Ont.
Draftsman, Public Works Department.

3. W. A. BUCKE, Toronto, Ont.
District Manager, Canadian General Electric Co.

1. J. CHALMERS, O.L.S., A. M. Can. Soc. C.E., Edmonton, Alta.
Structural Engineer, Department of Public Works.

4.*J. A. EWART, B.A.Sc., 193 Sparks St., Ottawa, Ont.
Architect and Engineer.

---

*Diploma with honours.

1894—*Continued.*

3. W. J. Herald, B.A.Sc., Toronto, Ont.
Engineering Department, Canada Foundry Co.

. H. E. Job, B.A.Sc., Hamilton, Ont.
Manufacturer of Electrical Machinery and Apparatus.

3. A. C. Johnston, B.A.Sc., M.E., Philadelphia, Pa.
Vice-President and Chief Engineer, The J. M. Dodge Company.

1. S. M. Johnston, B.A.Sc., P.L.S. Greenwood, B C.
City Engineer.

1. J. E. Jones, Engineers' Club, New York, N.Y.

3. N. M. Lash, Montreal, P.Q.
Assistant Electrical Engineer, Bell Telephone Co.

1.*A. L. McTaggart, B.A.Sc., Rockefeller Bldg., Cleveland O
Office of A. G. McKee, Consulting Engineer.

3.*W. Minty, B.A.Sc., Blackburn, Eng.
With Messrs. Yates & Thom, Ltd., Engineers.

3. C. J. Nicholson, Hamilton, Ont.
Assistant Engineer, Hamilton, Guelph & Waterloo Ry.

1. H. Rolph, Montreal, Que.
Secretary, John S. Metcalf Co., Ltd.

1. J. D. Shields, B.A.Sc., Toronto, Ont.
Sewer Engineer, Staff of City Engineer.

1. Angus Smith, O.LS., A.M. Can. Soc. C.E., Regina, Sask.
City Engineer.

3. A. K. Spotton, Galt, Ont.
Chief Engineer, Goldie & McCulloch Engine Works.

3. R. T. Wright, B.A.Sc., East Pittsburgh, Pa
Engineering Department, Westinghouse Machine Co.

1895.

1. J. Armstrong, B.A.Sc., Quebec, Que.
District Engineer, G.T.P. Ry.

3. A. E. Blackwood, 30 Church St., New York.
Manager New York Office, Sullivan Machinery Co.

1. E. J. Boswell, D.L.S., Winnipeg, Man.

3. G. Brebner (deceased).

3. W. M. Brodie, B.A.Sc., Pittsburgh, Pa.
With the Green Engineering Co. of Chicago.

3. L. L. Brown, 115 Broadway, New York.
Superintendent, The Foundation Co.

4. R. J. Campbell, Chicago. Ill.
Artist, Chicago Tribune.

3. A. W. Connor, B.A., C.E., 36 Toronto St., Toronto, Ont.
Bowman & Connor, Consulting Engineers.

1. J. S. Dobie, B.A.Sc., O. & D.L.S., Thessalon, Ont.

1. F. W. Guernsey, Bankhead, Alta
Assistant General Manager, Bankhead Mines, Ltd.

---

*Diploma with honours.

1895.—*Continued.*

4.*A. H. Harkness, B.A.Sc., Toronto, Ont.
Structural Engineer, Confederation Life Building.

3. H. S. Hull, B.A.Sc., Johnstown, Pa.
Structural Drawing, Cambria Steel Co.

3.*J. McGowan, B.A., B.A.Sc., Toronto, Ont.
Associate Professor of Applied Mechanics, University of Toronto.

3. W. N. McKay, Georgetown, Ont.
Manager, Bank of Hamilton.

3. H. L. McKinnon, B.A.Sc., Cleveland, Ohio.
Vice-President of The C. O. Bartlett & Snow Co.

1. W. W. Meadows, D. & O.L.S., Maple Creek, Sask.
Department of Public Works.

1. F. J. Robinson, D. & O.L.S., Regina, Sask.
Deputy Minister of Public Works. Saskatchewan.

3. F. T. Stocking, Toronto, Ont.
Hydro-Electric Commission.

3. R. C. C. Tremaine, B.A.Sc. (Deceased).

1896.

2.*J. W. Bain, B.A.Sc., Toronto, Ont.
Associate Professor of Applied Chemistry, University of Toronto.

2. L. T. Burwash, Dawson, Y.T.
Mining Recorder.

3.*G. M. Campbell, Riverside, Ill.
Superintendent, Power Apparatus Shops, Western Electric Co.

2. J. A. Decew, B.A.Sc., 615 Canadian Express Bldg., Montreal, Que.
Consulting Chemical Engineer.

3.*H. P. Elliott, B.A.Sc., E.E., Pittsburgh, Pa.
Electrical Engineer, Westinghouse Electric and Manufacturing Co.

3. W. C. Gurney, Toronto, Ont.
Vice-President, Gurney Foundry Co., Ltd.

3.*H. V. Haight, B.A.Sc., Sherbrooke, P.Q.
Chief Engineer, Canadian Rand Drill Co.

1. W. F. Laing, (deceased).

3. R.R. Lawrie, (deceased).

3. C. MacBeth, B.A.Sc., (deceased).

3. J. A. MacMurchy, Pittsburgh, Pa.
Chief Draftsman, Turbine Department, Westinghouse Machine Co.

1. T. Martin, B.A.Sc., Calgary, Alta.
Assistant Divisional Engineer, C.P.R., Western Division.

3. R.R. Scheibe, Toronto, Ont.
Sales Manager, Brigdens Ltd.

1897.

2. E. Andrews, B.Sc., A.M.I., C.E., Portmadoc, N. Wales.
Resident Engineer, Maenofferen Slate Quarry Co., Limited.

2.*J. A. Bow, Great Falls, Mont.
B. & M. Smelter.

---

*Diploma with honours.

1897—*Continued.*

1. H. S. CARPENTER, B.A.Sc., O.L.S., Regina, Sask.
Superintendent of Highways, Department of Public Works.

5. H. W. CHARLTON, B.A.Sc., Ottawa, Ont.
Assistant Chemist at Experimental Farm.

4.*E. A. FORWARD, A.M. Can. Soc. C.E., Lockport, Man.
Engineer-in-charge, St. Andrew's Lock and Dam.

3.*A. T. GRAY, B.A.Sc., Schenectady, N.Y.
Designing Engineer on Steam Turbines, General Electric Co.

3. W. A. B. HICKS, Buffalo, N.Y.
With Lackawanna Steel Co.

4. C. F. KING, Toronto, Ont.
Rep. of Mortimer Co. of Ottawa.

1. H. W. PROUDFOOT, (deceased).

2.*A. H. A. ROBINSON, B.A.Sc., M.A.I., M.E., Haileybury, Ont.
Mine Inspector.

4. W. F. SCOTT, Toronto, Ont.
Structural Engineer and Consulting Architect.

3.*W. R. SMILEY, B.A.Sc., Cleveland, Ohio.
With Wellman-Seaver-Morgan Engineering Co.

2.*W.W. STULL, B.A.Sc., O.L.S., Sudbury, Ont.
Surveyor and Mining Engineer.

1.*M. B. WEEKES, B.A.Sc., D.L.S., Regina, Sask.
Department of Public Works.

1. E. A. WELDON, Winnipeg, Man.
Provincial Land Surveyor's Office.

1898.

1. W. H. BOYD, B.A.Sc., Ottawa, Ont.
Geological Survey of Canada.

2. W. E. H. CARTER, B.A.Sc., Toronto, Ont.
Consulting Mining Engineer, 83 &85 Front Street, East.

3. E. H. DARLING, A.M. Can. Soc. C.E., Hamilton, Ont.
Assistant Engineer, Hamilton Bridge Works Co.

1. W. F. GRANT, B.A.Sc., Sault Ste. Marie, Ont.
City Engineer.

1. J. S. KORMANN, B.A.Sc., Toronto, Ont.
Manager, Kormann Brewing, Ltd.

3. J. E. LAVROCK, Vancouver, B.C.
Draftsman, Hermon & Burwell.

4. D. MACKINTOSH, B.A.Sc., B. Arch., New York, N.Y.
Chief Superintendent F. M. Andrews, & Co., Metropolitan Tower.

1. F.W. MCNAUGHTON, O.L.S., Winnipeg, Man.
Deputy Minister of Public Works.

1. J. H. SHAW, O.L.S., North Bay, Ont.
Surveyor and Engineer.

3. A. E. SHIPLEY, B.A.Sc., Nelson, B.C.
Manager, Nelson Coke & Gas Co.

---

*Diploma with honours.

1898—*Continued.*

3.*F. C. SMALLPIECE, B.A.Sc., Montreal, Que.
Assistant Manager, Canadian General Electric Co.

1. R. W. SMITH, P.L.S., Revelstoke, B.C.
Surveyor.

1.*J. A. STEWART, M.A., Hamilton, Ont.
Engineer and Contractor, 67 Federal Life Building.

1.*H. L. VERCOE, Montreal, Que.
Chief Draftsman, Grand Trunk Pacific Ry.

3. T. A. WILKINSON, New York, N.Y.
Statistician, Westinghouse Church Kerr Co.

3. D.A. WILLIAMSON, B.A.Sc., Hamilton, Ont.
With Hamilton Bridge Works Co.

1899.

3.*T. BARBER, Meaford, Ont.
Hydraulic Engineer, Chas. Barber & Sons.

2. J. T. M. BURNSIDE, B.A.Sc. Montreal, Que.

3. L. B. CHUBBUCK, B.A.Sc., E.E., Hamilton, Ont.
Engineer, Canadian Westinghouse Co.

2. G. A. CLOTHIER, Rossland, B.C.
Engineer, Le Roy Mining Co.

1. C. COOPER, Keokuk, Iowa.
Koekuk & Hamilton Water Power Co.

2. R. W. COULTHARD, B.A.Sc., Blairmore, Alta.
General Manager, West Canadian Collieries, Ltd.

3. J. A. CRAIG, B.A.Sc., Toronto, Ont.
Office of Willis Chipman, C.E.

2. J. C. ELLIOTT, Kelso, Ont.

3. W. E. FOREMAN, B.A.Sc., Pittsburgh, Pa.
Construction Dept., Westinghouse Electric and Mfg. Co.

3. E. GUY, B.A.Sc., Industry, Pa.
Engineering Dept., Westinghouse Electric and Mfg. Co.

3.*W. ALMON HARE, B.A.Sc., A.M. Can. Soc. C.E., Toronto, Ont.
Secy-Treas. and Chief Engineer, The Standard Engineering Co.

1. R. LATHAM, B.A.Sc., Hamilton, Ont.
Chief Engineer, T. H. & B. Ry.

3. W. MONDS, B.A.Sc., 36 Toronto St., Toronto, Ont.
Clark & Monds, Consulting Engineers.

1. J. PATTERSON, B.A., Toronto, Ont.
Physicist, Dominion Observatory.

3. A. S. H. POPE, B.A.Sc., Portland Oregon.
Pope & Wilcox, Electrical & Mechanical Engineers.

2.*G. E. REVELL, B.A.Sc., Nelson, B.C.

3.*E. RICHARDS, B.A.Sc., Toronto, Ont.
Assistant Electrical Engineer, City of Toronto.

3. G. A. SAUNDERS, Wilkinsburg, Pa.
With Westinghouse Electric & Manufacturing Co.

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*Diploma with honours.

1899—*Continued.*

1.*T. SHANKS, B.A.Sc., D.L.S., Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

1.*D. C. TENNANT, B.A.Sc., Lachine Locks, Que.
With Dominion Bridge Co.

3. W. W. VANEVERY, Sault Ste Marie, Ont.
Soo Corporation.

3. W. E. WAGNER, B.A.Sc., Toronto, Ont.
With Toronto Ferry Co.

2. G. H. WATT, D.L.S., Ottawa, Ont.
Dominion Land Surveyor.

3. E. YEATES, Hamilton, Ont.
Manager, London Machine Tool Co., Ltd.

1900.

1. J. L. ALLAN, A.M. Can. Soc., C.E., Halifax, N.S.
Office of Provincial Engineer.

2. E. G. R. ARDAGH, B.A.Sc., Toronto, Ont.
Lecturer in Applied Chemistry, University of Toronto.

3. J. A. BAIN, Ottawa, Ont.
Structural Engineer, Dept. of Public Works of Canada.

3. J. H. BARLEY, B.A.Sc., Hamilton, Ont.
Canadian Westinghouse Co.

2.*M. C. BOSWELL, M.A., Ph.D., Toronto, Ont.
Lecturer in Organic Chemistry, University of Toronto.

1. L. T. BRAY, D. & O.L.S., Edmonton, Alta.
District Engineer and Surveyor.

3. J. CLARK, Pittsburgh, Pa.
Electrician, P. & L. E. R. R.

2. J. E. DAVISON, B.A.Sc., Fort William.
Engineering Staff, Can. Northern Ry.

3. E. D. DICKINSON, Schenectady, N.Y.
With General Electric Co.

3. G. W. DICKSON, B.A.Sc., Toronto, Ont.
With Smith, Kerry & Chace.

2.*H.A.DIXON, B.A.Sc., M.L.S., Winnipeg, Man.
Division Engineer, Canadian Northern Railway.

2. C. H. FULLERTON, O.L.S., New Liskeard, Ont.
Engineer and Surveyor.

3. W. S. GUEST, B.A.Sc., Toronto, Ont.
Demonstrator in Electrical Engineering, University of Toronto.

3. W. HEMPHILL B.A.Sc., E.E., Buffalo, N. Y.
Superintendent, Cataract Power & Conduit Co.

3. S. E. M. HENDERSON, 422 Rubidge St., Peterboro, Ont.
Designing Engineer, Canadian General Electric Co.

3. J. A. HENRY, Schenectady, N. Y.
Designing Engineer, General Electric Co.,

2. H. S. HOLCROFT, B. A.Sc., D.L.S.
Surveyor, Peace River District.

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*Diploma with honours.

1900—*Continued.*

3. H. A. Johnson, 148 Clinton St., Toronto, Ont.
Manager, Johnston Oil Engine Co., Limited.

3. J. C. Johnston, Boston, Mass.
Plant Inspector, Warren Bituminous Paving Co.

2.*J. A. Johnston, B.A.Sc., Ignace, Ont.
Contractor.

2. R. E. McArthur, Montreal, Que.
Const. Dept., C.P.R.

2. J. G. McMillan, B.A.Sc., 39 Wood St., Toronto, Ont.
Mining Engineer.

3. L. Haun Miller, Cleveland, Ohio.
Sales Agent, Bethlehem Steel Co.

2. E. V. Neelands, B.A.Sc., Cobalt, Ont.
Hargrave Mines.

1.*E. H. Phillips, D.L.S., Saskatoon, Sask.
Phillips & Phillips, Civil Engineers and Surveyors.

2. J. R. Roaf, B.A.Sc., Michel, B.C.
Draftsman, Crow's Nest Pass Coal Co.

3.*C. H. E. Rounthwaite, Winnipeg, Man.
Draftsman, G.T.P. Ry.

2. H. W. Saunders, B.A.Sc., Gary, W. Va.
Division Engineer, U.S. Coal & Coke Co.

1. A. Taylor, D.L.S. & M.L.S., Portage La Prairie, Man.
Engineer and Surveyor.

1. W. C. Tennant, B.A.Sc. (deceased).

2. S. M. Thorne, B.A.Sc., Cobalt, Ont.
Engineering Staff, Silver Leaf Mine.

1. F. W. Thorold, B.A.Sc., Toronto, Ont.
Assistant City Engineer on Const. of Sewage System.

1. H. M. Weir, B.A.Sc., Pachuca, Mex.
With Real Del Morte Co.

3. F. D. Withrow, Ottawa, Ont.
Patent Examiner, Dept. of Agriculture.

1901.

1. R. H. Barrett, B.A.Sc., O.L.S. (deceased).

3. W. G. Beatty, Fergus, Ont.
Manager, Beatty Bros., Implement Manufacturers.

3. G. M. Bertram, Joplin, Mo.
Representative of the Sullivan Machinery Co.

3. W. J. Bowers (deceased).

3. E. T. J. Brandon, B.A.Sc., Toronto, Ont.
Assistant Engineer Hydro-Electric Power Comm.

3. W. P. Brereton, B.A.Sc., Winnipeg, Man.
Assistant Engineer, Power Construction Dept.

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*Diploma with honours.

1901—*Continued.*

3. J. T. Broughton, Scottdale, Pa.
Chief Engineer, Scottdale Foundry & Machine Co.
3.*W. G. Chace, B.A.Sc., Carnegie Library, Winnipeg Man.
Firm of Smith, Kerry & Chace.
3. A. G. Christie, 1713 Munro St., Madison, Wis.
Professor of Steam Engineering, University of Wisconsin.
3. J. R. Cockburn, B.A.Sc., A. M. Can. Soc. C.E. Toronto, Ont.
Lecturer in Descriptive Geometry, University of Toronto.
1. W. A. Duff, Ottawa, Ont.
Assistant Bridge Engineer, Transcontinental Ry.
2.*D. E. Eason, B.A.Sc., Peterboro', Ont.
Division Engineer, Trent Valley Canal.
1.*S. Gagne, B.A.Sc (deceased).
3. N. R. Gibson, B.A.Sc., Winnipeg, Man.
Assistant Engineer, Power Const. Dept.
2. A. T. E. Hamer, Wahnapitae, Ont.
Engineering Staff, Canadian Northern Ry. Co.
1. C. Harvey, B.A.Sc., D.L.S., Kelowna, B.C.
Consulting Engineer and Surveyor.
2. F. C. Jackson, La Tuque, Que.
Jackson & Connelly, Contractors, N.T.C. Ry.
3.*A. Laidlaw, Kansas, City, Mo.
District Manager, Trussed Concrete Steel Co.
3. W. C. Lumbers, Calgary, Alta.
Engineering Staff, C.P.R.
3. A. C. Macdougall, Massena, N.Y.
Asst. Superintendent, Aluminium Co. of America.
3. A. T. C. McMaster, B.A.Sc., Copper Cliff,
Engineer on Design & Construction, The Canadian Copper Co.
1. G. MacMillan, Ottawa, Ont.
Topographical Surveys Branch, Dept. of Interior.
3.*H. G. McVean, B.A.Sc., Moose Jaw, Sask.
Contractor and Engineer.
2. W. C. Matheson, Joliette, Que.
With McKenzie Mann. Co.
3. H. T. Middleton, Englewood Cliffs, N.J.
2. J. L. R. Parsons, B.A., D.L.S., Winnipeg, Man.
Engineer and Surveyor.
1. G. H. Power, North Battleford, Sask.
Western Canada Rep. of Willis Chipman, C.E.
3.*H. W. Price, B.A.Sc., Toronto, Cnt.
Lecturer in Electrical Engineering, University of Toronto.
1. H. P .Rust, B.A.Sc., A.M.Can. Soc., C.E., New York, N.Y.
With Messrs. Viele, Blackwell & Buck.
3. M. V. Sauer, B.A.Sc., Niagara Falls, Ont.
Assistant Engineer, Ontario Power Co.
3. W. H. Stevenson, B.A.Sc., Monadnock Block, Chicago, Ill.
Secretary Power Plant Specialty Co.

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*Diploma with honours.

1901—*Continued.*

1. R. D. WILLSON, Winnipeg, Man.
Assistant City Engineer.

1902.

3.*H. G. BARBER, Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

1. W. J. BLAIR, B.A.Sc., D. & O.L.S., New Liskeard, Ont.
Civil Engineer and Surveyor.

3. J. M. BROWN, Pittsburgh, Pa.
With Westinghouse Machine Co., Steam Turbine Dept.

2. W. G. CAMPBELL, Toronto, Ont.

2. A. R. CAMPBELL, Toronto, Ont.
Universal Mfg. Co., Ltd., St. James Chambers.

3. C. G. Carmichael (deceased).

2.*W. CHRISTIE, B.A.Sc., Prince Albert, Sask.
Dominion Land Surveyor.

2. F. T. CONLON, Thorold, Ont.
Welland Canal Engineering Staff.

3. H. V. CONNOR, Pittsburgh, Pa.
With Westinghouse Electric and Mfg. Co.

2.*M. T. CULBERT, deceased.

2. R.CUMMING, Toronto, Ont.
General Contractor. 50 Front St. E.

1. W. E. DOUGLAS, B.A., Toronto, Ont.
Contractor, 152 Bay St.

3.*R. J. DUNLOP, Toronto, Ont.
With Canadian Westinghouse Co.

2. W. M. EDWARDS, B.A.Sc., 1510 5th St. West, Calgary, Alta.
With Smith, Kerry & Chace.

3. W. ELWELL (deceased).

2. J. M. EMPEY, B.A.Sc.,O.L.S.,D.L.S., Calgary, Alta,
District Engineer and Surveyor, Dept. of Public Works.

2.*D. L. H. FORBES, Yzabal, Sonora, Mex.
Metallurgical Engineer El Tigre Mining Co.

1.*A. E. GIBSON, B.A.Sc., Toronto, Ont.
Office of Haney & Miller, Engineers and Contractors.

3. A. C. GOODWIN, Pittsburgh, Pa.
Draftsman, Aluminium Co. of America.

3. C. P. HENWOOD, McKeesport, Pa.
Draftsman, National Tube Co.

3. D. M. JOHNSTON, London, Ont.
Inspector, London Sub-station, Hydro-Electric Power Comm.

2. R. H. KNIGHT, B.A.Sc.,D.L.S., Edmonton, Alta.
Driscoll & Knight, Engineers and Surveyors.

5.*F. L. LANGMUIR, B.A.Sc.,Ph.D., Toronto, Ont.
Chemist, M. Langmuir Mfg. Co.

3. A. H. McBRIDE, B.A.Sc., Toronto, Ont.
Assistant Engineer, Hydro-Electric Power Commission.

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*Diploma with honours.

1902—*Continued.*

1. A. L. McLennan, D.L.S., Toronto, Ont.
Office of York Co. Engineer.

3. J. T. Mackay, Toronto, Ont.
Student in Faculty of Medicine, University of Toronto.

3. J. F. S. Madden, Winnipeg, Man.
Erecting Engineering Dept., Can. Gen. Electric Co.

3.*C. H. Marrs, Pittsburgh, Pa.
Designing Engineer, Riter-Conley Mfg. Co.

3. P. Mathison, B.A.Sc., Hamilton, Ont.
Electrical Eng.. Canadian Westinghouse Co.

3. R. S. Mennie, Pittsburgh, Pa.
With Crucible Steel Co. of America.

2. H. H. Moore, D.L.S.,A.M. Can. Soc. C.E., Calgary, Alta.
Dominion Land Surveyor and Engineer.

1.*T. S. Nash, Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

1. G. G. Powell, B.A.Sc., Toronto, Ont.
Asst. City Engineer, Roadways Dept.

1.*W. F. Ratz, D.L.S. (deceased).

3. H. D. Robertson, B.A.Sc., Toronto, Ont.
Miller, Cumming & Robertson, Engineers and Contractors.

3.*D. Sinclair, B.A.Sc. (deceased).

2.*I. J. Steele, D.L.S., Ottawa, Ont.
Topographical Surveys Branch, Dept. of Interior.

3. W. H. Sutherland, B.A.Sc., 107 St. James St., Montreal, Que.
Assistant Engineer, Montreal Water and Power Co.

3.*T. F. Taylor, 494 Concord Ave., Toronto, Ont.

2.*C. M. Teasdale, Concord, Ont.
Surveyor.

3. A. A. Wanless, Sydney Mines, N.S.
Lecturer, Sydney Mines Technical Schools.

3. H. J. Zahn, B.A.Sc., 235 Calumet St., Detroit, Mich.

1903.

3. H. G. Acres, Toronto, Ont.
Asst. Engineer, Hydro-Electric Power Commission.

1. J. G. R. Alison, Pittsburgh, Pa.
With Riter-Conley Mfg. Co.

3.*H. H. Angus, B.A.Sc., Bethlehem, Pa.
Draftsman, Bethlehem Steel Co.

3. J. A. Beatty, Peterboro', Ont.
Morrow & Beatty, Contractors.

3.*J. Breslove, East Pittsburgh, Pa.
Steam Turbine Engineer, Westinghouse Machine Co.

2. J. H. Burd, O.L.S., Sudbury, Ont.
Engineer and Surveyor.

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*Diploma with honours.

1903—*Continued.*

1.*E. L. Burgess, D.L.S., Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

2. N. A. Burwash, B.A.Sc., Whitehorse, Y.T.
Surveyor.

1. F. F. Clarke, D. & O.L.S. A.M. Can. Soc. C.E., Toronto, Ont.
Divisional Engineer, Can. Northern Ry.

2. C. L. Coulson, Welland, Ont.

3.*A. E. Davison, B.A.Sc., Toronto, Ont.
Engineering Staff, Hydro-Electric Power Commisssion.

3. C. J. Fensom, B.A.Sc., M.E., Toronto, Ont.
Consulting Mechanical Engineer, 43 Victoria St.

2.*E. O. Fuce, O.L.S., Galt, Ont.
Consulting Civil Engineer.

3*.F. A. Gaby, B.A.Sc., Toronto, Ont.
Assistant Chief Engineer, Hydro-Electric Power Commission.

1. J. C. Gardner, B.A.Sc., Niagara Falls, Ont.
City Engineer.

3. R. E. George, Dover, N.H.
Electrical and Gas Engineer, The United Gas & Electric Co.

1.*P. Gillespie. B.A.Sc., Toronto, Ont.
Lecturer in Theory of Construction, University of Toronto.

1. W. A. Gourlay, Toronto, Ont.
Engineering Staff, C.P.R.

2. J. F. Hamilton, B.A.Sc., C.E., Lethbridge, Alta.
Hamilton & Young, Dominion Land Surveyors and Engineers.

2. G. S. Hanes, B.A.Sc, O.L.S. North Vancouver, B.C.
City Engineer.

2. F. Y. Harcourt, B.A., Port Arthur, Ont.
Engineer, Public Works Dept.

1. L. J. Hayes, Chicago, Ill.
Structural Engineer, Corn Products Refining Co.

1.*F. D. Henderson, Sec'y. Board of Examiners for D.L.S., Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

5.*J. A. Horton, New Ontario.

3. J. G. Jackson, Toronto Ont.
Electrical Department, City Hall.

3. C. K. Johnston, Pefferlaw, Ont.
Merchant.

1. H. Johnston, O.L.S., Berlin, Ont.
Davis & Johnston, Civil Engineers and Surveyors.

3. A. G. Lang, Toronto, Ont.
Underground Superintendent, Toronto Hydro-Electric System.

1.*A. J. Latornell, B.A.Sc., Edmonton, Alta.
City Engineer.

1.*H. J. McAuslan, B.A.Sc., O.L.S., North Bay, Ont.
Staff of T. & N.O. Ry.

3. J. A. McFarlane, B.A.Sc., Hamilton, Ont.
Chief Draftsman, Hamilton Bridge Works Co.

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*Diploma with honours.

1903—*Continued.*

1.*A. L. McNaughton, *With G.P.T. Co.*	Prince Rupert, B. C.
5.*F. G. Marriott, B.A.Sc., *Chemist and Supt. Asphalt Plant, City Testing Laboratory.*	Toronto, Ont.
3.*C. A. Maus,	Paris, Ont.
3.*M. L. Miller, *Draftsman, McClintic-Marshall Construction Co.*	Pittsburg, Pa.
3. P. H. Mitchell, *Consulting Electrical Engineer, Trader's Bank Building.*	Toronto, Ont.
2.*R. H. Montgomery, B.A.Sc., O. and D.L.S., *Engineer and Surveyor.*	Prince Albert, Sask.
1. F. A. Moore, *Engineering Dept., C. N. Ry.*	Winnipeg, Man.
3. E. E. Mullins, *Baldwin Locomotive Works.*	Limon, Costa Rica, C.A.
3. I. H. Nevitt, B.A.Sc., *Construction Bell Telephone Co.*	Toronto, Ont.
1. E. W. Oliver, B.A.Sc., C.E., *Assistant Chief Engineer, Canadian Northern Ry. System.*	Toronto, Ont.
3. J. P. Oliver, *Supt. of Construction, The American Sugar Refining Co.*	Arabi, La.
3. J. D. Pace, B.A.Sc., *Construction Engineer, Canadian Westinghouse Co.*	Montreal, Que.
3. B. B. Patten, B.A.Sc., *Rutherford & Patten, Engineers and Surveyors.*	St. Catharines, Ont.
2. D. H. Philp, *Georgian Bay Canal Survey.*	Ottawa, Ont.
3.*D. H. Pinkney, *National Tube Dept., U.S. Steel Corporation.*	Elyria, O.
2. T. H. Plunkett, B.A.Sc.,	Toronto, Ont.
1. D. F. Robertson, D.L.S.,	Ottawa, Ont.
3.*H. M. Schiebe, B.A.Sc., *Engineer, Westinghouse Electric & Mfg. Co.*	East Pittsburgh, Pa,
1.*H. L. Seymour, *Sanders & Seymour, Civil Engineers and Dominion Land Surveyors.*	Edmonton, Alta.
1. J. H. Smith, D. & O.L.S., *Engineer and Surveyor, 140 Jasper Ave.W.*	Edmonton, Alta.
3. H. G. Smith, B.A.Sc., (deceased).	
3. S. L. Trees, B.A.Sc., *Supt. Mfg. Dept., Samuel Trees & Co., 42 Wellington St. East.*	Toronto, Ont.
2. J. E. Umbach, *Topographical Surveys Branch, Department of the Interior.*	Ottawa, Ont.
1. J. Waldron, D.L.S., *Engineer and Surveyor.*	Moose Jaw, Sask.
3.*S. B. Wass, *Chief Engineer, Amostook Valley Railroad.*	Presque Isle, Me.
3. J. A. Whelihan,	Regina, Sask.

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*Diploma with honours.

1903—*Continued.*

3. H. F. White, London, Ont.
Assistant Superintendent, The Geo. White & Sons Co., Ltd.

2.*C. G. Williams, B.A.Sc., Elk Lake, Ont.
Superintendent, Otisse Mining Co.

1.*N. D. Wilson, B.A.Sc., Lumsden Bldg., Toronto.
Engineer and Surveyor.

1.*C. R. Young, B.A.Sc., A.M. Can. Soc. C.E., Toronto, Ont.
Lecturer in Structural Engineering, University of Toronto.

1904.

3.*J. H. Alexander, B.A., St. Louis, Mo.
Engineer, Hunkins-Willis L. & C. Co.

3.*J. H. Barrett, Toronto, Ont.
With the Wm. Davies Co., Ltd.

3. M. B. Bonnell, Bobcaygeon, Ont.

3. T. D. Brown, B.A.Sc., Calgary, Alta.
Canadian Fairbanks Co.

3. F. W. Burnham, B.A.Sc., Milwaukee, Wis.
Steam & Electrical Department, Allis-Chalmers-Bullock Co.

3. J. W. Calder, B.A.Sc., Fort William, Ont.
With Hydro-Electric Commission.

1. N. C. Cameron, 4172 Dorchester St., Montreal, Que.
Dominion Engineering and Construction Co.

1. A. J. Campbell, B.A.Sc., Toronto, Ont.

3.*A. M. Campbell, B.A.Sc., 1403 King St. W., Toronto, Ont.

4. J. B. Challies, Ottawa, Ont.
Hydraulic Engineer, Department of the Interior.

2. C. A. Chilver Walkerton, Ont.

2. H. L. Chilver, Moosehorn Bay, Man.

1. U. W. Christie, B.A.Sc., O.L.S., Ottawa, Ont.
Astronomical Surveys Branch, Dept. of the Interior.

2. P. C. Coates, B.A.Sc., Cobalt, Ont.
Mining Engineer.

1. S. B. Code, Smith's Falls, Ont.
Town Engineer.

1.*T. F. Code, B.A.Sc (deceased).

1.*W. A. Cowan, Farnham, Que.
Resident Engineer, C.P.R.

3.*S. E. Craig, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1.*S. R. Crerar, B.A.Sc., O.L.S., Toronto, Ont.
Lecturer in Surveying, University of Toronto.

3. W. M. Currie, Hamilton, Ont.
Managing Director, Canada Steel Co. Ltd.

3. H. H. Depew, Fernie, B.C.
Supt., Crow's Nest Pass Electric Light and Power Co.

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*Diploma with honours.

1904—*Continued.*

2. A. J. Elder, Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

2. J. G. Fleck, Vancouver, B.C.
Fleck Bros. Ltd.

1.*A. L. Ford, B.A.Sc., Prince Rupert, B.C.
Government Inspector on G.T.P. Ry.

3. W. S. Gibson, B.A.Sc., 38 Park Rd., Toronto, Ont.

1. J. N. Goodall, Toronto, Ont.

1. J. P. Gordon, Toronto, Ont.
Engineering Staff, Willis Chipman, C.E.

3. W. W. Gray, B.A.Sc., Toronto, Ont.
Lecturer in Mechanical Engineering, University of Toronto.

1. A. Gray, B.A.Sc., Port Credit, Ont.
With St. Lawrence Starch Co.,

3. W. K. Greenwood, B.A.Sc., Orillia, Ont.
Town Engineer.

1. L. D. Hara, St. Catharines, Ont.
Assistant Engineer, Welland Canal Co.

3. C. J. Harris, B.A.Sc., Brantford, Ont.
With Brantford Screw Co.

1. J. B. Heron, B.A.Sc., Toronto, Ont.
c. o. *S. H. Sykes, 1577 Danforth Ave.*

1. E. M. M. Hill, Winnipeg, Man.
Engineering Dept., Canadian Northern Railway.

2. S. N. Hill, 325, Waverly St., Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

2. C. J. Ingles, Niagara Falls, Ont.
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1. E. A. James, B.A.Sc., Toronto, Ont.
Managing Editor, Canadian Engineer.

1. P. V. Jermyn, B. A.Sc., 118 King St. West, Toronto, Ont.
C.P.R. Construction Department.

3. W. S. H. Keefe, Fort Covington, N.Y.
Manager, Light, Heat and Power Co.

3. W. J. Larkworthy (deceased).

3. O. B. McCuaig, B.A.Sc., Wenatchee, Wash.
Supt. ,Entiat Light and Power Co.

1. G. G. McEwen, B.A.Sc., Winchester, Ont.
Office of T. H. Dunn, O.L.S.

1.*W. G. McFarlane, B.A.,B.A.Sc.,
Engineer and Surveyor, Peace River Dist.

3.*C. P. McGibbon, B.A., East Pittsburgh, Pa.
With Westinghouse Electric and Mfg. Co.

3. C. McKay, B.A.Sc., (deceased).

1. D. McMillan, Woodville, Ont

3. G. J. Manson, Thorold, Ont.
With Manson Mfg. Co., Ltd.

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*Diploma with honours.

1904—*Continued.*

1.*W. N. Moorhouse, Toronto, Ont.
Office of Sproatt & Rolph, Architects.

3. E. E. Moore, Glen Falls, N.Y.
Engineer, Inter-State Iron Co.

3. W. H. Munro, Ottawa, Ont.
Assistant to J. B. McRae.

3. G. Pace, B.A.Sc., Hamilton, Ont.
With Canadian Westinghouse Co.

3. W. S. Pardoe, B.A.Sc., Philadelphia, Pa.
Instructor in Hydraulics, University of Pennsylvania.

3. J. Paris, La Tuque, Que.
Resident Engineer, Trans. Ry.

2. J. Parke, B.A.Sc., Havilah, Ont.
Chemist and Assayer.

3. W. J. Parker, Ottawa, Ont.
Top. Surveys Branch, Dept. of Interior.

3.*A. E. Pickering, Sault Ste. Marie, Ont.
Supt., Lake Superior Power Co.

1. D. L. C. Raymond, B.A.Sc., Toronto, Ont.
Manager, The Concrete Engineering and Construction Co., Ltd.

1. F. B. Reid, B.A.Sc., Ottawa, Ont.
Astronomical Surveys Branch, Dept. of the Interior.

3.*M. R. Riddell, B.A.Sc., Toronto, Ont.

3. G. S. Roxburgh, B.A.Sc., Winnipeg, Man.
Manager, Fetherstonhaugh & Co., Patent Solicitors and Engineers.

2. F. N. Rutherford, B.A.Sc., St. Catharines, Ont.
Rutherford and Patten, Surveyors and Engineers.

1.*J. D. Sheply, B.A.Sc., D.L.S., N. Battleford, Sask.
District Surveyor and Engineer.

3. F. W. Slater, B.A.Sc., Schenectady, N.Y.
With General Electric Co.

3.*R. S. Smart, Ottawa, Ont.
Manager, Fetherstonhaugh & Co., Patent Solicitors and Engineers.

1. D. A. Smith, B.A.Sc., Claude, Ont.

3. W. J. Smither, B.A.Sc., 50 St. Clair Ave., Toronto, Ont.

3. S.E. Thomson, B.A.Sc., Niagara Falls, Ont.
Engineering Staff, Electrical Development Co.

3. C. J. Townsend, B.A.Sc., Toronto, Ont.

1. D. T. Townsend, B.A.Sc., O.L.S., Winnipeg, Man.
C.P.R. Land Department.

1. A. V. Trimble, B.A.Sc., Toronto, Ont.
Hydro-Electric Power Commission.

3. B. B. Tucker, B.A.Sc., Morrisburg, Ont
Resident Engineer, New York and Ontario Power Co.

2.*E. Wade, B.A., Welland, Ont.
Teacher.

1.*E. W. Walker, B.A.Sc., (deceased).

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*Diploma with honours.

1904—*Continued.*

3. J. P. Watson, B.A.Sc., Montreal, Que.
Draftsman, Motive Power Dept., C.P.Ry.

1. J. M. Weir, Hamilton, Ont.
Engineering Staff, G.T. Ry.

1.*A. F. Wells, O.L.S.,B.A.Sc., Toronto, Ont.
Wells & Gray, Ltd., Engineers and Contractors.

1. W. R. Worthington, B.A.Sc., Toronto, Ont.
Assistant Sewer Engineer, Staff of City Engineer.

3. W. F. Wright, Toronto, Ont.
Sales Dept., Canadian General Electric Co.

1905.

2. H. W. Arens, (deceased).

3. R. H. Armour, 165 Broadway, New York.
Westinghouse Electric & Manufacturing Co.

3.*C. B. Aylesworth, Hamilton, Ont.
Draftsman, Canadian Westinghouse Co.

1.*W. Barber, B.A.Sc., Toronto, Ont.
Roadways Department, City Hall.

2.*W. A. Begg, B.A.Sc., Regina, Sask.
Department of Public Works.

3.*G. G. Bell, Walkerville, Ont.
Canadian Bridge Co.

1. J. C. Boeckh, Toronto, Ont.
With Boeckh Brush Co.

3. W. M. Bristol, Halifax, N.S.
Canadian Westinghouse Co.

2. W. C. Campbell, Keene, Ont.
Mining Engineer.

3. W. R. Carson, High Bridge, N.J.
Construction Engineer, Taylor Iron and Steel Co.

1. A. V. Chase, Orillia, Ont.

3. S. R. A. Clement, Toronto, Ont.
With Hydro-Electric Power Commission.

3. T. E. Corrigan, Bodie, Cal.
Chief Electrician, Standard Consolidated Mining Co.

1.*N. L. R. Crosby, B.A.Sc., Chicago, Ill.
Assistant Contracting Engineer, McClintic-Marshall Const. Co.

1. G. H. Ferguson, B.A.Sc., Toronto, Ont.
Hydro-Electric Commission.

3. H. S. Fierheller, B.A.Sc. (deceased).

3. F. W. Harrison, 360 Pearl St., Brooklyn, N.Y.
Chief Mechanical Draftsman, Edison Electric Illuminating Co.

1. M. C. Hendry, B.A.Sc., Toronto, Ont.

2. C. S. L. Hertzberg, Walkerville, Ont.
Trussed Concrete Steel Co.

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*Diploma with honours.

1905—*Continued.*

3. W. G. Hewson, B.A.Sc., Toronto, Ont.
With Smith, Kerry and Chace.
1. G. S. Jones, Smith's Falls, Ont.
3.*G. Kribs, Toronto, Ont.
With Smith, Kerry and Chace.
2. P. A. Laing, Fanquier, Ont.
Resident Engineer, T.C. Ry.
1. A. Latornell, B.A.Sc., Toronto, Ont.
Sewer Department, City Hall.
3. J. W. Leighton, Toronto, Ont.
Secretary, Evans Rotary Engine Co.
1.*T. R. Loudon, B.A.Sc., Toronto, Ont.
Lecturer in Metallurgy, University of Toronto.
3. S. E. McGorman, Walkerville, Ont.
Draftsman, Canadian Bridge Co.
1.*W. W. McGregor (deceased).
2. D. W. McKenzie, Winnipeg, Man.
Draftsman, Engineering Dept., C.N. Ry.
3.*C. A. McLean, Toronto, Ont.
Canadian Westinghouse Co.
2. W. N. McLean, Erin, Ont
3. F. G. Mace, Ottawa, Ont.
Patent Examiner, Dept. of Agriculture.
3. R. W. Moffatt, B.A.Sc., Toronto, Ont.
Demonstrator in Drawing, University of Toronto.
3. L. W. Morden, Toronto, Ont.
Canadian Westinghouse Co.
3. G. R. Munro, B.A.Sc., Peterboro', Ont.
With Hudson Bay Survey.
3.*W. G. Nicklin, B.A.Sc., Front & Tetellier Sts., Grand Rapids, Mich.
Assistant Superintendent, Dalnu & Kiefer Tanning Co.
1. E. D. O'Brien, Nipigon, Ont.
With Transcontinental Ry.
1.*B. B. Patten, B.A.Sc., St. Catharines, Ont.
Rutherford and Patten, Surveyors and Engineers.
1. E. P. A. Phillips, B.A.Sc., O.L.S., Porcupine, Ont.
Pierce & Phillips, Engineers & Surveyors.
1. W. B. Porte, Oakville, Ont.
2. E. F. Pullen, Cochrane, Ont.
Resident Engineer, Transcontinental R.R.
2. G. L. Ramsey, B.A.Sc., Dunnville, Ont.
1. G. W. Rayner, Thorold, Ont.
3.*R. B. Ross, (deceased).
5. T. E. Rothwell, B.A.Sc., Belleville, Ont.
Provincial Assay Office.
2.*G. S. Scott, Toronto, Ont.
Fellow in Mineralogy, University of Toronto.

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*Diploma with honours.

1905—*Continued.*

3. H. V. SERSON, Highbridge, N.J.
Engineer in charge, Power House Const., Taylor Iron & Steel Co.

3. C. H. SHIRRIFF, B.A.Sc., Toronto, Ont.
Chemist, Imperial Extract Company.

3.*C. E. SISSON, Peterboro', Ont.
Engineering Department, Canadian Gen. Electric Co.

1. D. L. N. STEWART, B.A.Sc., Collingwood, Ont.

1. M. A. STEWART, Toronto, Ont.
Assistant City Engineer, Roadway Dept., City Hall.

3.*W. F. STUBBS, Galt, Ont.
Assistant Engineer, Goldie & McCulloch Co.

1. N. H. STURDY, Cleveland, Ohio.
Designer, L, S. & M. S. Ry.

1. W. G. SWAN, B.A.Sc., Langley, B.C.
Divisional Engineer, C. N. Ry.

1.*F. H. SYKES, O.L.S., D.L.S., Toronto, Ont.
Asst. Structural Engineer, with City Architect, City Hall.

3. L. R. THOMSON, B.A.Sc., Winnipeg, Man.
Lecturer in Civil Engineering, University of Manitoba.

3. E. D. TILLSON, B.A.Sc., New York, N.Y.
Engineer for Const. Dept., Safety Insulated Wire & Cable Co.

1.*J. J. TRAILL, B.A.Sc., Toronto, Ont.
Lecturer in Mechanical Engineering, University of Toronto.

1.*W. M. TREADGOLD, B.A., Toronto, Ont.
Lecturer in Surveying, University of Toronto.

3. W. E. TURNER, B.A.Sc., Salt Lake City, Utah.
With Utah Light & Ry. Co.

3. A. E. UREN, Toronto, Ont.
Editor, Acton Publishing Co.

3. J. M. VAUGHAN, 58 Melville Ave., Toronto, Ont.
Contractor.

1. H. L. WAGNER, B.A.Sc., Hamilton, Ont.
Draftsman, Hamilton Bridge Works Co.

2. W. H. YOUNG, B.A.S c.,D.L.S., Lethbridge, Alta.
Hamilton & Young, Dominion Land Surveyors and Engineers.

1906.

1. F. ALPORT, Superior Junct., Ont.
Resident Engineer, Transcontinental Ry.

3.*W. L. AMOS, Guelph, Ont.

1. A. H. ARENS, Inverness, N.S.
Resident Engineer, Inverness Ry. & Coal Co.

3.*J. C. ARMER, B.A.Sc., Toronto, Ont.
Secretary and Managing Editor of the Canadian Manufacturer Pub. Co. Ltd.

1. M. H. BAKER, B.A.Sc., St. Thomas, Ont.
Assistant City Engineer.

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*Diploma with honours.

1906—*Continued.*

3. F. W. Baldwin, Baddeck, N.S.
With Graham Bell, Esq.

2. E. W. Banting, B. A.Sc., Toronto, Ont.
Demonstrator in Surveying, University of Toronto.

3. F. Barber, B.A., Toronto, Ont.
York County Engineer, 57 Adelaide St. E.

2. M. Bates, B.A.Sc (deceased).

2. J. P. Bellisle, (deceased).

3.*H. H. Betts, B.A.Sc., Rio de Janiero, Brazil
Rio de Janiero Tramway, Light & Power Co.

5.*D. E. Beynon, B.A.Sc., Toronto, Ont.
With Dunlop Rubber Goods Co.

2. G. W. Bissett, Naughton, Ont.
Mill Supt., Canadian Exploration Co., Ltd.

3. W. C. Blackwood, B.A.Sc., Toronto, Ont.
Demonstrator in Physics, University of Toronto.

3. H. E. Brandon, B.A.Sc., Winnipeg, Man.
Chief Engineer, Vulcan Iron Works.

1. M. E. Brian, B.A.Sc., O.L.S., A.M. Can. Soc. C.E., Windsor, Ont.
City Engineer.

2. T. W. Brown, B.A.Sc., D. & S.L.S., Saskatoon, Sask.
Civil Engineer.

1.*A. E. K. Bunnell, B.A.Sc., Weyburn, Sask.
Engineering Staff, Willis Chipman, C.E.

3. F. M. Byam, Toronto, Ont.
With Smith, Kerry, and Chace.

3. A. Cameron, Toronto, Ont
Draftsman, Canada Foundry Co.

3. A. W. Campbell, B.A.Sc., Toronto, Ont.
Inspector, Hydro-Electric Power Commission.

1. M. J. Carroll, Ottawa, Ont.
Topographical Surveys Branch, Department of the Interior.

3.*R. E. C. Chadwick, Toronto, Ont.
Staff of City Engineer.

1.*G. T. Clark, B.A., Saskatoon, Sask.
City Engineer.

3.*G. A. Colhoun, Hamilton, Ont.
Draftsman, The Hamilton Bridge Works Co., Ltd.

1.*W. A. M. Cook, B.A.Sc., Toronto, Ont.
Staff of City Architect, City Hall.

1.*E. L. Cousins, B.A.Sc., Toronto, Ont.
Resident Engineer, G. T. Ry., Middle and Southern Div.

4. A. G. Creighton, Prince Albert, Sask.
Creighton & McConnell, Architects and Structural Engineers.

4. W. N. Daniels, 1215 Filbert St., Philadelphia, Pa.
With John R. Wiggins & Co.

3.*N. P. F. Death, B.A.Sc., 25 Jarvis St., Toronto, Ont.
Death & Watson, Electrical Engineers and Contractors.

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*Diploma with honours.

1906—*Continued.*

3. C. S. Dundass, B.A.Sc. *With Dominion Bridge Co.*	Lachine, Que.
3. S. L. Fear, *With Dunbar, Sullivan Dredging Co.*	Amherstburg, Ont.
5.*C. C. Forward, *Laboratory of the Inland Revenue Department.*	Ottawa, Ont.
5. C. W. Graham, B.A.Sc., *Industrial Chemist, Wm. Davies Co.*	Toronto, Ont.
1.*P. W. Greene. *With Hydro-Electric Power Commission.*	Toronto, Ont.
3. C. B. Hamilton, B.A.Sc., *Hamilton Gear and Machinery Co.*	43 Madison Ave., Toronto, Ont.
1.*A. L. Harkness, B.A.Sc., *With Dominion Bridge Co., Ltd.*	Lachine Locks, Que.
1.*R. L. Harrison, *Resident Engineer, Canadian Northern Ry.*	Cobourg, Ont.
1. E. Harrison, B.A.Sc., *With Sutcliffe & Neelands.*	New Liskeard, Ont.
3. J. C. Hartney, B.A.Sc., *Engineer & Salesman, Canadian Westinghouse Co.*	Vancouver, B.C.
1. S. Hett, B.A.Sc., *Surveyor.*	Sutton West, Ont.
3. C. R. Hillis, *With Toronto & Niagara Power Co.*	Toronto, Ont.
3. C. W. Hookway, B.A.Sc., *Allis-Chalmers Bullock Co.*	Winnipeg, Man.
3. R. H. Hopkins, B.A.Sc., *Demonstrator in Electrical Engineering, University of Toronto.*	Toronto, Ont.
1.*R. S. Houston,	Emerson, Man.
2.*W. Huber, *With Canadian Inspection Co.*	Toronto, Ont.
3.*A. H. Hull, B.A.Sc., *With Smith, Kerry and Chace.*	Toronto, Ont.
3. W. C. Jepson, *Welland Canal Office.*	Niagara Falls, Ont.
1.*C. Johnston, B.A.Sc., *District Engineer, Can. Northern Ry.*	Toronto, Ont.
1. G. R. Jones, B.A.Sc., *Missionary.*	China.
3. T. Jones, B.A.Sc.,	18 Meredith Crescent, Toronto, Ont.
1.*A. E. Jupp, B.A.Sc.,	Haileybury, Ont.
3. J. D. Keppy, *Canadian Inspection Co.*	Toronto, Ont.
1. J. L. Lang, B.A.Sc., D. & O.L.S., *Lang & Keys, Engineers and Surveyors.*	Sault Ste. Marie, Ont.
3. A. P. Linton, B.A.Sc., *With Dominion Bridge Co.*	Montreal Que.

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*Diploma with honours.

1906—*Continued.*

4.*A. Wellesley McConnell, B.A.Sc., Toronto, Ont.
Lecturer in Architecture, University of Toronto.

3.*D. G. McIlwraith, Galt, Ont.
Draftsman, The Goldie & McCulloch Co., Ltd.

2. J. A. McKenzie, Cobalt, Ont.
Manager, Nipissing Reduction Co.

1.*J. V. McNab, Kenora, Ont.
Transitman, C.PR. Engineering Staff.

3. J. A. McPherson, Toronto, Ont.
Student, Faculty of Medicine, University of Toronto.

2. K. A. MacKenize, B.A.Sc., Toronto, Ont.
Managing Editor, "Builder & Contractor."

1. W. MacKinnon, Rankin, Pa.
Erection Dept., McClintic Marshall Construction Co.

3.*W. Maclachlan, B.A.Sc., Belleville Ont.
Trenton Electric and Waterpower Co.

3.*D. W. Marrs, Pittsburg, Pa
Designer and Estimator, Riter-Conley Mfg., Co.

3. W. A. Maxwell, Walkerville, Ont.
Draftsman, Canadian Bridge Co.

1.*Rev. J. Mellon Menzies, B.A.Sc., D.L.S., North Honan, China.
Missionary, Wu An

3. L. R. Miller, B.A.Sc., Orillia, Ont.

1.*B. F. Mitchell, B.A.Sc., Edmonton, Alta.
Municipal Engineer.

1. F. F. Montague, 506 Union Bank Bldg., Winnipeg, Man.
Law Student.

1.*W. J. Moore, O.L.S., Pembroke, Ont.
Morris and Moore, Land Surveyors and Architects.

1. C. R. Murdock, Weyburn, Sask.

2. C. J. Murphy, B.A.Sc., Fernie, B.C.
Assistant Engineer, Crow's Nest Pass Coal Co.

1.*W. P. Near, B.A., B.A.Sc., Toronto, Ont.
Staff of City Engineer.

2. R. Neelands, Port Hammond, B.C.

3. D. G. Park, B.A.Sc., West Allis, Wis.
With Allis-Chambers-Bullock Co.

3. G. W. Paterson, Vancouver, B.C.
Salesman, Canadian Financiers, Ltd.

5. R. E. Pettingill, Port Colborne, Ont.
Chief Chemist, Portland Cenemt Co.

2.*R. C. Purser, B.A.Sc., Windsor, Ont.

3. N. R. Robertson, B.A.Sc., Walkerton, Ont.

1. J. O. Roddick, B.A.Sc., Toronto, Ont.
Assistant Engineer, Dept. of Public Works of Canada.

1. C. H. Rogers, B.A.Sc., Peterboro' Ont.
Peterboro Canoe Co.

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*Diploma with honours.

1906—*Continued.*

2.*O. Rolfson, B.A.Sc., D.L.S.., Peace Kiver District.
Dominion Land Surveyor.

1. R. C. Ross, B.A.Sc., Ottawa, Ont
Department of the Interior.

1. K. G. Ross, Sault Ste. Marie, Ont.
With Lang & Keys, Engineers and Surveyors.

1.*H. T. Routly, O.L.S., D.L.S., Haileybury, Ont.
Routly, Summers & Malcolmson, Engineers amd Surveyors.

2. J. H. Ryckman, Chicago, Ill.
Bridge and Bldg. Dept., Chicago Milwaukee & St. Paul Ry.

3.*W. K. Sanders, 58 Webster St., West Newton, Mass.

1.*W. A. Scott, B.A.Sc., D.L.S., Galt, Ont.
Dominion Land Surveyor.

1.*W. M. Stewart, B.A.Sc., 142 Aberdeen Ave., Hamilton, Ont.

2. J. E. Thomson, B.A.Sc., W. Virginia, U. S. A.
With Sterling Coal Co.

3.*C. L. Vickery, 112 Barlow St., Fall River, Mass.
Chief Engineer, American Thread Co.

5. W. E. Wickett (deceased).

3.*J. N. Wilson, B.A.Sc., Toronto, Ont.
Electrical Dept., City of Toronto.

3*E. M. Wood, B.A.Sc., 136 Lee Ave., Toronto, Ont .

1907.

3.*F. G. Allen, B.A.Sc., Hyde Park, Mass.
Assistant to Chief Engineer, B.F. Sturtevant Co.,

1. F. J. Anderson, B.A.Sc., Niagara Falls, Ont.

1. A. P. Augustine, Vancouver, B.C.
B. C. Land Surveyor.

3.*H. D. Bowman, B.A.Sc., Niagara Falls, Ont.
With the Ontario Power Co.

3. W. S. Brady, B.A.Sc., Toronto, Ont.

1. G. H. Broughton, Penticton, B.C.

1. J. A. Brown, B.A.Sc., Toronto, Ont.
Fellow in Drawing, University of Toronto.

1. C. E. Bush, B.A.Sc., 285 College St., Toronto, Ont.

3. J. H. Caster, Peterboro', Ont.
Production Dept. Can. Gen. Elec. Co.

1.*E. Cavell, Saskatoon, Sask.
Wiggins & Cavell, Surveyors and Engineers.

1.*C. B. B. Connell, Glasgow, Scotland.
With Mirrless & Watson.

3.*G. C. Cowper, B.A.Sc., Frankford, Ont.
Trent Valley Canal.

2. J. V. Culbert, B.A.Sc., Toronto, Ont.
Staff of Willis Chipman, C.E.

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*Diploma with honours.

1907—*Continued.*

3.*R. S. Davis, B.A.Ss., Calgary, Alta.
Sales Engineer, Canadian Westinghouse Co.

3. S. D. Evans, B.A.Sc., Leamington, Ont.

3.*F. R. Ewart, B.A.Sc., Toronto, Ont.

1. G. R. S. Fleming, Toronto, Ont.
With Atwell Fleming Printing Co.

6. P. C. Fux, B.A.Sc., Brantford, Ont.
With Waterous Engine Works Co.

1. J. S. Galletly, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2. G. Galt, B.A.Sc., East Ely, Nevada.
With Nevada Co.

1. A. B. Garrow, B.A.Sc., Toronto, Ont.
Staff of City Engineer.

1. A. Gillies, B.A.Sc., Fort William, Ont.

1. G. W. Graham, Eugenia, Ont.

3. C. S. Grasett, B.A.Sc., 8 Harbord St., Toronto, Ont.

1.*R. E. W. Hagarty, B.A.Sc., Toronto, Ont.
Demonstrator in Drawing, University of Toronto.

3. K. Hall, B.A.Sc., 39 Sherman Ave., Hamilton.

1. C. T. Hamilton, B.A.Sc., Niagara Falls, Ont.
With Ontario Power Co.

3. R. A. Hare. St. Catharines, Ont.

3.*H. O. Hill, B.A.Sc., Pittsburgh, Pa.
With Riter-Conley Mfg. Co.

1.*T. H. Hogg, B.A.Sc., Niagara Falls, Ont.
Assistant to Supt. of Construction, Ontario Power Co.

3.*C. H. Hutton, B.A.Sc., Hamilton, Ont.
Engineering Staff, Dominion Power Co.

1. H. M. Hyland, B.A.Sc., 72 St. Mary St., Toronto, Ont.

3. E. W. Hyman, B.A.Sc., London, Ont.
Assistant Superintendent, London Electric Co.

3.*L. G. IreLand, B.A.Sc., Belleville, Ont.
Supt., Midland Construction Co., Ltd.

1.*W. Jackson, B.A.Sc., Niagara Falls, Ont.
With Ontario Power Co.

4.*C. B. Jackson, Chicago, Ill.
Estimating Dept. E. Everett Clora Co.

3.*E. W. Kay, B.A.Sc., Winnipeg, Man.
Salesman, Canadian Westinghouse Co.

3. D. F. Keith, Provo, Utah.
Electrical Engineer, Telluride Power Co.

1. H. P. Keith Comber, Ont.

1. A. A. Kinghorn, B.A.Sc., Toronto, Ont.
Inspector of Road ways, City Engineers Department.

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*Diploma with honours.

1907—*Continued.*

1. L. W. Klingner 568 Spadina Ave., Toronto, Ont.

1\.*F. C. Lamb, B.A.Sc., North Battleford, Sask.
Department of Public Works.

3. A. D. LePan, B.A.Sc., Toronto, Ont.
Assistant Superintendent of Buildings and Grounds, University of Toronto.

1. J. H. Lindsay, Toronto, Ont.
Fellow in Surveying, University of Toronto.

3. J. A. D. McCurdy, Hammondsport, N.Y.
With Graham Bell, Esq.

1\.*J. B. McFarlane, B.A.Sc., 60 Lonsdale Rd., Toronto, Ont.
Dominion Land Surveyor.

3\.*D. J. McGugan, B.A.Sc., Vancouver, B.C.
With Humphreys & Tupper, Civil Engineers and Surveyors.

3. A. H. McIntosh, Chicago, Ill.
With Illinois Steel Co.

3. F. W. McNeill, B.A.Sc., Peterboro', Ont.
Canadian General Electric Co.

1\.*M. K .McQuarrie, Vancouver, B.C.
Terminal Engineer, C.P. Ry. Co.

1\.*G. MacLeod, Montreal, P.Q.
Assistant Secretary, Can. Soc. C.E.

1. A. G. Mackay, New York, N.Y.
With Hudson & Manhattan Ry. Co.

1. W. S. Malcolmson, B.A.Sc., Haileybury, Ont.
Routly, Summers & Malcolmson, Engineers and Surveyors.

3. S. A. Marshall, Snelgrove, Ont.

6. D. H. C. Mason, B.A.Sc., Toronto, Ont.

1. J. W. Melson, B.A.Sc., Toronto, Ont.
Fellow in Drawing, University of Toronto.

1. G. G. Mills, B.A.Sc., Toronto, Ont.

3. J. B. Minns, B.A.Sc., Peterboro', Ont.
Canadian General Electric Co.

4\.*G. N. Molesworth, Toronto, Ont.
Draftsman, Eden Smith & Son, Architects.

1. J. M. Moore, B.A.Sc., London, Ont.
With McClary Mfg. Co.

5\.*P. F. Morley, 177 Pearson Ave., Toronto, Ont.

1. E. W. Murray, Stratford, Ont.
Engineer, with Edge & Gutteridge, Contractors and Builders.

3. J. D. Murray, Toronto, Ont.
With Fetherstonhaugh & Co., Patent Solicitors and Engineers.

1. E. W. Neelands, B.A.Sc., New Liskeard, Ont.
Sutcliffe & Neelands, Consulting Engineers.

1. R. E. K. Neelands, B.A.Sc., Brampton, Ont.

2\.*B. Neilly, B.A.Sc., Cobalt, Ont.
Assayer, Black Consolidated.

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*Diploma with honours.

1907—*Continued.*

1. A. E. Nourse, B.A.Sc., Toronto, Ont.
Assistant Engineer, Expanded Metal Co.

3. J. J. O'Sullivan, Toronto, Ont.
With Canada Railway News Co.

2. T. K. Paton, Wardner, Ida.
Mining Engineer.

1. F. W. Paulin, O.L.S., Niagara Falls, Ont.
Civil Engineer.

1. R. B. Potter, Toronto, Ont.
Post-Graduate course in Engineering. University of Toronto.

3.*F. E. Prochnow, B.A.Sc., Buffalo, N.Y.
With Wilhelm, Parker & Ward, Patent Attorneys.

3.*J. F. Procunier, Bayham. Ont.

3. G. E. Quance, B.A.Sc., Delhi, Ont.

3.*H. Raine, Hamilton, Ont.
With Hamilton Bridge Works Co.

1.*J. L. Rannie, B.A.Sc., Ottawa, Ont.
Observer, Geodetic Survey.

3. C. W. B. Richardson, B.A.Sc., Montreal, Que
Motive Power Dept., Angus Shops.

1. A. A. Ridler, Toronto, Ont.
Supt., Constructing & Paving Co., Ltd.

5. H. E. Rothwell, Port Richmond, N.Y.
Assistant Chemist, Standard Varnish Works.

5. C. A. Schofield, Buffalo, N.Y.
Chemist, Schoell-Kopf-Hartford & Hanna Co.

1.*A. C. T. Sheppard, Ottawa, Ont.
Department of Mines.

1. F. R. Smith, B.A. Gowganda, Ont.
Manager, Can. Gowganda Silver Mines.

3. E. R. Smithrim, B.A.Sc., Sault Ste., Marie, Ont.
With Tagona Water and Light Co.

1.*W. Snaith, Toronto, Ont.
Assistant Engineer, Barber & Young.

3. A. C. Spencer, B.A.Sc., London, Ont.
Mechanical Engineer, McClary Mfg. Co.

3. G. S. Stewart, Toronto, Ont.
Agent, Canadian General Electric Co.

1. J. A. Stiles, B.A.Sc., Toronto, Ont.
Demonstrator in Drawing, University of Toronto.

3.*J. L. Stiver, Ottawa, Ont.
Electrical Standard Laboratory, Inland Revenue Department.

1. J. L. G. Stuart, B.A.Sc., Toronto, Ont.
Railway and Special Works Department, City Hall.

1. G. F. Summers, O.L.S., Haileybury, Ont.
Routly, Summers & Malcolmson, Engineers and Surveyors.

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*Diploma with honours.

1907—*Continued.*

1.*H. W. Sutcliffe, New Liskeard, Ont.
Sutcliffe & Neelands, Consulting Engineers.
1. P. M. Thompson, B.A.Sc., Ambridge, Pa.
Draftsman, American Bridge Co.
3. O. R. Thomson, B.A.Sc., Berlin, Ont.
Inspector, Hydro-Electric Power Commission.
1. L. R. Thomson, B.A.Sc., Winnipeg, Man.
Lecturer in Civil Engineering, University of Manitoba.
1. W. J. Walker, Nipigon, Ont.
With Transcontinental Ry.
1. E. D. Wilkes, B.A.Sc., Toronto, Ont.
Main Drainage Department, City Hall.
3. A. F. Wilson, B.A.Sc., Chicago, Ill.
Inspector, Ghicago, Telephone Co.
3. M. H. Woods, Toronto, Ont.
Post-Graduate Course in Engineering, University of Totonto.
1. G. W. A. Wright, 517 Oxford St., London, Ont.
Warren Bituminous Paving Co.
3.J. Young, Toronto, Ont.
Inspector, Canadian Fire Underwriter's Association.
3.*A. R. Zimmer, B.A.Sc., Toronto, Ont.
Demonstrator in Electrical Engineering, University of Toronto.

1908.

3. H. G. Akers, B.A.Sc., Toronto, Ont.
Demonstrator in Electrochemistry, University of Toronto.
3. L. F. Allan, Toronto, Ont.
Roadway Dept., City Hall.
1.*C. B. Allison, South Woodslee, Ont.
1.*R. M. Anderson, B.A.Sc., Burlington, Ont.
5. J. R. Arens, Toronto, Ont.
Post -graduate Course in Engineering, University of Toronto.
3. H. C. Barber, Toronto, Ont.
Post-graduate Course in Engineering, University of Toronto.
1. E. Bartlett, B.A.Sc., Smithville, Ont.
Dominion Land Survey Work.
2. F. J. Bedford, Porcupine, Ont.
1.*G. G. Bell, Portland, Me.
With Sawyer & Moulton, Consulting Engineers.
3. G. E. Black, B.A.Sc., Toronto, Ont.
Public Works Department of Ontario.
3. H. F. Bowes, Toronto, Ont.
Superintendent of Warren Bituminous Paving Co., Ltd.
3.*J. H. Brace, Brooklyn, N.Y.
With N.Y. Telephone Co.

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*Diploma with honours.

1908—*Continued.*

1. P. R. Brecken, B.A.Sc., Montreal, Que.
General Secretary, Y.M.C.A.

3. E. I. Brown, Nipissing, Ont.
Assistant Engineer on Const. Can. Westinghouse Co., Nipissing Power Company.

1. W. F. M. Bryce, Ottawa, Ont.
Assistant Engineer, City Engineer's Department.

3. P. H. Buchan, B.A.Sc., Vancouver, B.C.
Engineering Department, B.C. Electric Ry. Co., Ltd.

2. J. E. Campbell, B.A.Sc., Copper Cliff, Ont.
Canadian Copper Co.

3. N. A. Campbell, Calgary, Alta.
Chief Chemist, Canada Cement Co.

3. A. M. Carroll, Cobalt, Ont.
Manager, Rochester Cobalt Mines, Ltd.

1. H. R. Carscallen, B.A.Sc., Calgary, Alta.
Assistant Hydrographer, with P. M. Sauder.

3. G. Challen, Goderich, Ont.

1. F. H. Chesnut, B.A.Sc., Mount Lebanon, B.C.
Resident Engineer, C.N.R. Plant.

1. W. E. Cole (deceased).

4.*W. C. Collett, B.A.Sc., Toronto, Ont.
Draftsman, F. S. Baker Trader's Bank Bldg.

1. R. Y. Cory, B.A.Sc., 530 Huron St., Toronto, Ont.

3.*H. Coyne, B.A.Sc., 5930 South Park Ave., Chicago, Ill.
Designing Draftsman.

2.*J. D. Cumming, B.A.Sc., Copper Cliff, Ont.

6. A. D. Dahl, B.A.Sc., Midland, Mich.
Chemist, Dow Chemical Co.

1. F. A. Danks, Box 230, Penticton, B.C.

3. J. Darroch, Detroit, Mich.
Draftsman, Autoparts Mfg. Co.

3. H. C. Doorly, 6 McClellan St., Schenectady, N.Y.

2. R. H. Douglas, Edmonton, Alta.
Department of Public Works,

2.*F. C. Dyer, B.A.Sc., Toronto, Ont.
Demonstrator in Mining, University of Toronto.

1. F. M. Eagleson, Gorrie, Ont.

1. C. Edwards, B.A.Sc., Toronto, Ont.
With Standard Sanitary Mfg. Co.

1. S. L. Evans, B.A.Sc., Corinth, Ont.

1. E. O. Ewing, Campbellford, Ont.

1. O. L. Flanagan, B.A.Sc., Toronto, Ont.
With C. H. Mitchell, Consulting Engineer, 1003 Traders' Bank Bldg.

1. C. Flint, B.A.Sc., Monadnock, B.L., Chicago.
With MacDonald Engine Co.

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*Diploma with honours.

1908—*Continued.*

1. A. H. Foster, B.A.Sc.,	Toronto, Ont.
3. G. C. Francis, *City Engineer's Staff, Roadway's Department.*	Toronto, Ont.
3. S. S. Gear,	Fort Erie.
1. C. A. Grassie, B.A.Sc.,	Welland, Ont.
3.*C. L. Gulley, B.A.Sc., *Demonstrator in Electrical Engineering, University of Toronto.*	Toronto, Ont.
3. J. W. Hackner, B.A.Sc., *Inspector of Public Works.*	Nairn Centre, Ont.
3. F. L. Haviland, *Draftsman, Hamilton Bridge Works Co.*	Hamilton, Ont.
1.*C. D. Henderson, *Canadian Bridge Co.*	Walkerville, Ont.
5.*D. J. Huether, B.A.Sc., *Manager, Century Rubber Trading Co.*	Plainfield, N.J.
1. A. D. Huether, B.A.Sc.,	77 Grenville St., Toronto, Ont.
3.*A. N. Hunter, B.A.Sc., *Demonstrator in Electrical Engineering, University of Toronto.*	Toronto, Ont.
3. S. B. Iler, *Construction Department, Seymour Power & Electric Co.*	Belleville, Ont.
1.*J. T. Johnston, B.A.Sc., *Assistant Engineer on Construction of Trent Canal.*	Campbellford, Ont.
2. H. G. Kennedy, *Post Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1.*W. R. Keys,	Winchester, Ont.
3.*J. N. M. Leslie, B.A.Sc., *With Canadian Westinghouse Co.*	Hamilton, Ont.
3. F. C. Lewis, *American Bridge Co.*	Chicago, Ill.
3. H. R. Lynar, *Lynar & Mace, Consulting Engineers.*	Toronto, Ont.
1.*W. G. McGeorge, *Consulting Engineer.*	Chatham, Ont.
1. J. M. McGregor,	Ridgetown, Ont.
1. L. A. McLean, B.A.Sc., (deceased).	
1. W. A. A. McMaster,	Palmerston, Ont.
1. H. C. McMordie, B.A.Sc., *With Canadian Bridge Co.*	Walkerville, Ont.
1.*A. A. McRoberts, B.A.Sc., *Assistant on Dominion Land Survey.*	Pontypool, Ont.
5.*N. G. Madge, *Chief Chemist, Continental Rubber Co. of N. Y.*	New York, N. Y.
3. J. E. Malone, *With Illinois Steel Co.*	Chicago, Ill.
5. K. D. Marlatt, *The Marlatt & Armstrong Co.*	Oakwell, Ont.

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*Diploma with honours.

1908—*Continued.*

1. R. J. Marshall, B.A.Sc., Toronto, Ont.
Demonstrator in Applied Mechanics, University of Toronto.

5. G. L. Milligan, Toronto, Ont.
Post-graduate Course in Engineering, University of Toronto.

1. A. B. Mitchell, Cambridge, Mass.
Student in Architectecture, Harvard University.

4.*J. C. P. Molesworth (deceased).

3. E. D. Monk, B.A.Sc., Pittsfield, Mass.
Testing Department, General Electric Co.

3.*F. H. Moody, B.A.Sc., 49-55 Lafayette St., New York, N.Y.
Associate Editor of "Machinery."

3. J. H. Morice, B.A.Sc., 938 Albany, St., Schenectady, N.Y.

3. F. E. H. Mowbray, B.A.Sc., Hamilton, Ont.
Canadian Westinghouse Co.

3.*W. P. Murray, B.A.Sc., Montreal, Que.
Dominion Bridge Co.

3. W. deC. O'Grady, Winnipeg, Man.
Engineer, Gas Traction Co., Ltd.

1. H. J. Peckover, B.A.Sc., Toronto, Ont.
Fellow in Drawing, University of Toronto.

1.*M. Pequegnat, B.A.Sc., Toronto, Ont.
Demonstrator in Drawing, University of Toronto.

1. H. G. Phillips, Saskatoon, Sask.
Phillips & Phillips, Civil Engineers and Surveyors.

3. M. Pivnick, Toronto, Ont.
Student in Dentistry.

1.*E. M. Proctor, B.A.Sc., Toronto, Ont.
Draftsman, Canada Foundry Co.

3.*C. F. Publow, B.A.Sc., 305 Gladstone Ave., Toronto, Ont.

1. J. T. Ransom, B. A.Sc., Toronto, Ont.
Fellow in Surveying, University of Toronto.

1.*W. B. Redfern, B.A.Sc., Steelton, Ont.
Resident Engineer for Willis Chipman, C.E.

1. F. L. Richardson, B.A.Sc., Toronto, Ont.
With Miller, Cummings & Robertson.

3. H. A. Ricker, B.A.Sc., 101 Leeming St., Hamilton. Ont.

1. A. R. Robertson, B.A.Sc., Toronto, Ont.
Staff of City Engineer.

5. F. A. Robertson, Toronto, Ont.
Assistant Advertising & Business Manager, Farmers' Magazine.

1.*W. A. Robinson, Winnipeg, Man.

3. R. C. Robinson, 134 Edmonton St., Winnipeg, Ont.

5. L. J. Rogers, Toronto, Ont.
Demonstrator in Chemistry, University of Toronto.

2.*R. R. Rose, B.A.Sc., Copper Cliff, Ont.
With Canadian Copper Co.

3. D. Ross, 387 Princess Ave., London Ont.

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*Diploma with honours.

1908—*Continued.*

1. A. O. Secord, Brantford, Ont.

3. W. E. V. Shaw, B.A.Sc., Toronto, Ont.
Purchasing Engineer, Hydro-Electric Power Commission.

3. H. F. Shearer, B.A.Sc., E. Norwood, Ohio.
Testing Engineer, Bullock Electric Mfg. Co.

1. W. L. Stamford, B.A.Sc., Point du Bois, Man
Inspector on Concrete Work, Hydro-Electric Power Plant.

3. R. H. Starr, B.A.Sc., Toronto, Ont.
Toronto Hydro-Electric System, City Hall.

3. A. W. J. Stewart, Toronto, Ont.
Electrical Department, City Hall.

3. J. St. Lawrence, Erie, Pa.
Supt. of Engine Shops, Erie City Iron Works.

1. J. J. Stock, Toronto, Ont

1. H. B. Stuart, B.A.Sc , Hamilton, Ont.
Draftsman, Hamilton Bridge Works Co.

2. J. L. G. Stuart, B.A.Sc., Toronto, Ont.
Railway & Special Works Department, City Hall.

3. A. D. Sword, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. J. W. R. Taylor, B.A.Sc., Hamilton, Ont.
With Canadian Westinghouse Co.

1.*W. E. Taylor, B.A.Sc., Toronto, Ont.
Fellow in Drawing, University of Toronto.

3. V. C. Thomas, B.A.Sc., Toronto, Ont.
Demonstrator in Hydraulics, University of Toronto.

1. J. H. Thornley, B.A.Sc., 943 Dundas St., London. Ont.

1. C. G. Toms, B.A.Sc., 60 Spencer Ave., Toronto, Ont.

1. H. W. Tye, Winnipeg, Man.
Construction Dept., C.P.R.

3. C. P. Van Norman, Toronto, Ont.
Post-graduare Course in Engineering, University of Toronto.

1. T. L. Villeneuve, Chicoutimi, Que.
Assistant Engineer, Dept., of Public Works.

1. J. A. Walker, B.A.Sc., Nelson, B.C.
With A. L. McCulloch, C.E., B.C.L.S.

3.*B. W. Waugh, Toronto, Ont.
Post-graduate Course in Engineering, University of Toronto.

3. R. M. Wedlake, B.A.Sc., Brantford, Ont.
With Cockshutt Plow Co., Ltd.

3. R. P. Weir, Toronto, Ont.
With C. H. Mitchell, Consulting Engineer.

1. A. M. West, B.A.Sc., Vancouver, B.C.
C.N.R. Office.

1. W. R. White, Drayton, Ont.

3. W. J. White, B.A.Sc., Boston, Mass.
Supt., on Construction, General Electric Co.

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*Diploma with honours.

1908—*Continued.*

3.*F. D. Wilson, *Draftsman, McGregor & McIntyre, Ltd.*	Toronto, Ont.
1. J. M. Wilson, *City Engineer.*	Moose Jaw, Sask.
1. D. O. Wing, *With G.T.P. Co.*	Prince Rupert, B.C.
3*R. Young,	Lake Burnstzean, Burrard Inlet., B.C.

1909.

3. E. G. Arens, *Draftsman with H. D. Symmes, Contractor.*	Niagara Falls, Ont.
3. H. V. Armstrong, *Engineering Staff of Willis Chipman, C.E.*	Dunnville, Ont.
2.*E. T. Austin, *Post-graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
3. W. H. Barry, B.A.Sc.,	Niagara Falls, Ont.
3. R. D. S. Beckstedt, B.A.Sc.,	Wilkinsburg, Pa.
3. R. E. Beith, *With Transcontinental Ry.*	Cochrane, Ont.
1.*G. A. Bennett, B.A.Sc., *Domimion Land Surveyor, Dept. of the Interior.*	Box 1928, Calgary, Alta.
3. E. R. Birchard, B.A.Sc., *Canada Producer & Gas Engine Co.*	Barrie, Ont.
3. W. D. Black, B.A.Sc., *Supt., Otis-Fensom Elevator Co., Ltd.*	Montreal, Que.
3.*D. C. Blizard, *Post-graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1.*W. J. Boulton,	Wallaceburg, Ont.
3. G. H. Bowen, B.A.Sc., *Engineer on Construction, Queen Victoria Park.*	Niagara Falls, Ont.
3. C. E. Brown, B.A.Sc., *Canadian Westinghouse Co.*	Hamilton, Ont.
1. E. W. Browne, B.A.Sc.,	247 Cannon St. E., Hamilton, Ont.
1. J. A. Buchanan,	Comber, Ont.
3. J. E. Burns, B.A.Sc.,	231 Seaton St., Toronto, Ont.
1. M. G. Cameron, B.A.Sc.,	Peterboro', Ont.
3.*R. A. Campbell,	Alliston, Ont.
1. V. S. Chesnut, *Canadian Northern Ontario Ry.*	Mount Lebanon, B.C.
1.*C. G. Cline, *Post-graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1. J. G. Collinson, B.A.Sc.,	St. Thomas, Ont.
1. G. W. Coltham, B.A.Sc.,	Aurora, Ont.
3.*H. A. Cooch, B.A.Sc., *Demonstrator in Electrical Engineering, University of Toronto.*	Toronto, Ont.

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*Diploma with honours.

1909—*Continued.*

3. W. E. Corman, Stony Creek, Ont.
3. T. H. Crosby, Toronto, Ont.
Post-graduate Course in Engineering, University of Toronto.
3. R. H. Cunningham, Chicago, Ill.
With Bryan-Marsh Co.
1.* F. A. Dallyn, B.A.Sc 1488 King St. W., Toronto, Ont.
3. C. N. Danks, Sherbrooke, Que.
Draftsman, Canadian Rand Co., Ltd.
1. E. M. Dann, Ottawa, Ont.
Railway Lands Branch, Dept. of the Interior.
3. H. W. Davis, Kingston, Ont.
With A. Davis & Son, Ltd., Leather Manufacturers.
2.*A. I. Davis, B.A.Sc., 82 Kendal Ave., Toronto, Ont.
1. H. C. Davis, Burlington, Ont.
1. I. H. Dawson, St. Catharines, Ont.
Draftsman.
3. W. H. Delahaye, B. A. Sc., Pembroke, Ont
3. W. P. Derham, B.A.Sc., Ottawa, Ont.
5.*W. A. Dodds, B.A,S.c., Syracuse, N.Y.
With Penman Littlehales Chemical Co.
1. R. H. Douglas, Edmonton, Alta.
Department of Public Works.
1. F. S. Falconer, B.A.Sc., Shelburne, Ont.
3. T. A. Fargey, B.A.Sc., Newark, N. J.
With General Electric Co.
1. J. B. Ferguson, Chicago, Ill.
3. A. T. Fergusson, B.A.Sc., Toronto, Ont.
3. T. E. Freeman, B.A.Sc., Peterboro', Ont.
Canadian General Electric Co.
3. E. R. Frost, B.A.Sc., Toronto, Ont.
With Smith, Keery & Chace.
1. A. E. Glover, Toronto, Ont.
Post-graduate Coures in Engineering, University of Toronto.
5. A. E. Gooderham, Toronto, Ont.
1. D. A. Graham, B.A.Sc., Ivan, Ont.
2. R. R. Grant, 106 Warren Rd., Toronto, Ont.
1. J. E. Gray, Toronto, Ont.
Post-graduate Course in Engineering, University of Toronto.
1. G. E. D. Greene, B.A.Sc., Toronto, Ont.
1. W. H. Greene, 26 South Drive, Toronto, Ont.
1. W. W. Gunn, B.A.Sc., Montreal, Que.
With Dominion Bridge Co.
3. C. J. Harper, Pittsfield, Mass.
1. D. W. Harvey, B.S.Ac., London, Ont.
1. C. O. Hay, 114 Liberty St., New York, N.Y
Supt. on Construction, Muralt & Co.

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*Diploma with honours.

1909—*Continued.*

3.*J. Hemphill, *Canton Electric Power Co.*	Canton, Ohio.
1.*G. Hogarth, *Engineer's Office, Dept. of Public Works of Ontario.*	Toronto, Ont.
3. A. E. Holmes, B.A.Sc., *Canadian Westinghouse Co.*	Hamilton, Ont.
3. C. R. Holmes, *Post-graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1. G. C. Hoshal, B.A.Sc.,	Toronto, Ont.
3. C. Hughes, B.A.Sc.,	Toronto, Ont.
1. A. E. Hunter, B.A.Sc.,	Toronto, Ont.
3.*H. Irwin, B.A.Sc., *Secretary, Engineering Society, University of Toronto.*	Toronto, Ont.
3. J. Isbister, B.A.Sc.,	Wingham, Ont.
3. F. P. Jackes, B.A.Sc., *With Canadian Westinghouse Co.*	Toronto, Ont.
1.*J. E. Jackson,	Oxford Centre, Ont.
1. E. W. James, B.A.Sc.,	Toronto, Ont.
1.*C. C. Johnson, B.A.Sc., *City Hall.*	Toronto, Ont.
1. C. E. Johnston. *Post-graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1. W. J. Johnston,	Porcupine, Ont.
1.*A. H. E. Keffer, *With T. & N.O. Ry.*	North Bay, Ont.
3. J. B. O. Kemp, B.A.Sc., *Fellow in Drawing, University of Toronto.*	Toronto, Ont.
3. W. R. Key, B.A.Sc., *Mechanical Draftsman.*	Toronto, Ont.
5. H. N. Klotz, B.A.Sc., *Chemist, Gutta Percha & Rubber Co.*	Toronto, Ont.
3. A. W. Lamont, B.A.Sc., *Sales Engineer, Canadian Westinghouse Co., Ltd.*	Winnipeg, Man.
3.*C. B. Langmuir, B.A.Sc., *Sales Dept., Factory Products, Ltd.*	Toronto, Ont
3. A. E. Lennox, B.A.Sc., *National Electric Lamp Association.*	Cleveland, Ohio.
1.*R. W. E. Loucks, *Asst. to A. Fawcett, D.L.S.*	Delisle, Sask.
1. N. C. A. Lloyd,	
3. E. D. MacFarlane, B.A.Sc.,	Cleveland, Ohio.
1. J. G. Mackinnon, *Optical Dept., T. Eaton Co.*	Toronto, Ont.
1. W. A. MacLachlan	Guelph, Ont.
3. B. A. Maclean, B.A.Sc.,	Hamilton, Ont.
1. N. W. Macpherson, B.A.Sc.,	St. Thomas, Ont.

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*Diploma with honours.

1909—*Continued.*

3. D. D. McAlpine, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1. A. S. McArthur, B.A.Sc., Toronto, Ont.
3. C. R. McCollum, B.A.Sc., Toronto, Ont.
With Canada Cycle & Motor Co.
3.*A. S. McCordick, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. P. J. McCuaig, B.A.Sc., Milwaukee, Wis.
1. F. H. McKechnie, Cochrane, Ont.
Resident Engineer, Trans. Ry.
3. W. G. McIntosh,.
3. G. McLeod, Waupaca, Wis.
Electrician, Electric Light & Ry. Co.
1. V. McMillan, B.A.Sc., Toronto, Ont.
3. N. H. Manning, B.A.Sc., Toronto, Ont.
Demonstrator in Mechanical Engineering. University of Toronto.
1.*A. B. Manson, B.A.Sc., Stratford, Ont
City Engineer's Staff.
1.*E. S. Martindale, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1. O. W. Martyn, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
2. C. A. Morris, B.A.Sc., Toronto, Ont.
3. G. Morton, B.A.Sc., Calgary, Alta.
Canadian Westinghouse Co.
1.*F. V. Munro, B.A.Sc., Toronto, Ont.
Fellow in Drawing, University of Toronto.
1. E. A. Neville, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1. J. Newton, B.A.Sc., Toronto, Ont.
City Engineer's Department.
3.*L. S. Odell, Toronto, Ont.
Fellow in Drawing, University of Toronto.
3. V. J. O'Donnell, Toronto, Ont.
3. J. J. O'Hearn, Peterboro', Ont.
Canadian General Electric Co.
1. A. W. Pae, Calgary, Alta.
District Hydrographer.
1.*A. M. Petry, B.A.Sc., Toronto, Ont.
Assistant Manager, " Chas. Potter."
1. R. B. Pigott, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
2. G. M. Ponton, Blairmore, Alta.
With West Canadian Collieries Co.
3.*C. J. Porter, B.A.Sc., Portland, Oregon.
Draftsman, Mount Hood Ry. & Power Co.
3. A. I. Proctor, Hamilton, Ont.

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*Diploma with honours.

1909—*Continued.*

1. J. Quail, Toronto, Ont.
1. A. F. Ramsperger, Toronto, Ont.
Draftsman, With Toronto Iron Works Ltd.
1.*C. R. Redfern, B.A.Sc., Toronto, Ont.
Demonstrator in Applied Mechanics. University of Toronto.
3.*L. T. Rutledge, B.A.Sc., Toronto, Ont.
Fellow in Drawing, University of Toronto.
1. A. U. Sanderson, B.A.Sc., Toronto, Ont.
3.*R. A. Sara, Toronto, Ont.
Post-Graduate Course in Engineering, Univrsity of Toronto.
3.*A. Schlarbaum, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3.*C. Schwenger, B.A.Sc., Toronto, Ont.
Electrical Department, City Hall.
1. C. A. Scott, Toronto, Ont.
Roadway Department, City Hall.
1. A. Sedgwick, Kaministikuia, Ont.
Engineer, Dog Lake Storage Works.
1. B. H. Segre, Winnipeg, Man.
1. F. V. Seibert, Toronto, Ont.
Fellow in Surveying, University of Toronto.
5. M. R. Shaw, Midland, Mich.
Chemist, Dow Chemical Co.
3. M. W. Sparling, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. J. J. Spence, Toronto, Ont.
1. D. S. Stayner, B.A.Sc., Toronto, Ont.
Bridge Department, City Engineer's Office.
1.*N. C. Stewart, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1.*P. H. Stock, St. Catharines, Ont.
Resident Engineer, N. St. C. & T. R. Ry.
1. J. C. Street, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. S. Stroud, B.A.Sc., East Pittsburgh, Pa.
Westinghouse Electric & Manufacturing Co.
1. C. C. Sutherland, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1. R. G. Swan, B.A.Sc., Toronto, Ont.
1. A. D. Sword, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1.*H. W. Tate, B.A.Sc., Toronto, Ont.
3.*E. A. Thompson, Toronto, Ont.
With Smith, Kerry & Chace.
1. G. A Tipper, B.A.Sc., Toronto, Ont.
3. A. G. Trees, B.A.Sc., Toronto, Ont.

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*Diploma with honours.

1909—*Continued.*

3. W. G. Turnbull, B.A.Sc., *The Cutler Hammer Mfg. Co.*	Milwaukee, Wis.
1. J. E. Underwood,	Lakelet, Ont.
1. C. P. VanNorman, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1. J. VanNostrand, *Student.*	Toronto, Ont.
1. A. Vatcher, B.A.Sc., *With the Reid Newfoundland Co.*	Freshwater, Bay deVerde, Nfl.
1. C. M. Walker, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1. E. E. Webb,	Orillia, Ont.
1. C. E. Webb, B.A.Sc.,	Toronto, Ont.
3. F. C. White, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
3. A. R. Whitelaw, *With Smith, Kerry & Chace.*	Toronto, Ont.
1. R. G. Wilkinson,	Aberarder, Ont.
5.*J. A. McK. Williams, B.A.Sc.,	Toronto, Ont.
1.*O. T. G. Williamson, B.A.Sc.,	Guelph, Ont.
3. L. R. Wilson, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
3. F. F. Wilson, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
2. S. A. Wookey, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.

1910.

2. J. H. Adams, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
3.*O. F. Adams, *Fellow in Electrical Engineering, University of Toronto.*	Toronto, Ont.
1.*W. G. Amsden, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1. J. A. Baird, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1.*W. J. Baird.	
1. H. A. Barnett, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1.*E. W. Berry,	Seaforth, Ont.
1.*H. C. Bingham, *City Engineer's Department.*	Moose Jaw Sask.
2. D. G. Bisset, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.
1. R. H. H. Blackwell,	Toronto, Ont.
1.*E. P. Bowman, *Post-Graduate Course in Engineering, University of Toronto.*	Toronto, Ont.

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*Diploma with honours.

1910—*Continued.*

2. A. F. Brock, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. M. O. Browne, Toronto, Ont.

3. J. R. Burgess, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. N. G. H. Burnham, Toronto, Ont.

3.*W. C. Cale, Glenwood Springs Colo.
With Central Colorado Power Co.

2.*A. D. Campbell, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. W. M. Carlyle, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. N. S. Caudwell, Toronto, Ont.

1.*D. C. Chisholm, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. J. A. Claveau, Chicoutimi, P.Q.

3. L. S. Cockburn, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. A. G. Code, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. C. R. Cole, Woodstock, Ont.

1. G. A. Colquhoun, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

4.*J. H. Craig, Toronto, Ont.
Fellow in Drawing, University of Toronto.

3.*C. D. Dean, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. R. L. Dobbin, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3.*W. P. Dobson, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3.*J. M. Duncan, Toronto, Ont.

2. V. H. Emery, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. W. J. Evans, Jermyn, Ont.

3. H. W. Fairlie, Toronto, Ont.
Tungsiolier Co., of Canada.

3.*C. R. Ferguson, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. J. W. Ferguson, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

4.*J. B. K. Fisken, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. A. W. Fletcher, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1.*J. A. Fletcher, Fisher River, Man.
Assistant to E. W. Robinson, D.L.S.

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*Diploma with honours.

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3. F. T. FLETCHER, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. T. R. C. FLINT,

3. R. C. FOLLETT,

2. J. M. FOREMAN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. W. J. FOSTER,

3.*W. C. FOULDS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. A. FRASER, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2. J. FREDIN, London, Ont.

1. M. M. GIBSON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. V. A. E. GOAD, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. V. S. GOODEVE, Toronto, Ont

2. W. A. GORDON, Sundridge, Ont.

3. V. F. GOURLAY, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2. R. L. GREENE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

5. J. H. HARRIS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1.*N. J. HARVIE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. J. G. HELLIWELL, Toronto, Ont.

1. J. F. HENDERSON, Toronto, Ont.

3. F. G. HICKLING, Wilkinsburg, Pa.

2.*P. E. HOPKINS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3.*W. J. IRWIN, East Pittsburg, Pa.
Apprenticeship Course, Westinghouse Machine Co.

2. F. L. JAMES, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. H. C. JOHNSTON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. R. H. JOHNSON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. J. C. KEITH, Toronto, Omt.
Post-Graduate Course in Engineering, University of Toronto.

2.*J. T. KING, Toronto, Ont.
Fellow in Mining Engineering, University of Toronto.

3. G. A. KINGSTONE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2. G. L. KIRWIN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

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5. P. T. KIRWIN, Toronto, Ont.
Fellow in Chemistry, University of Toronto.

1. S. KNIGHT, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. E. R. LAWLER, Toronto, Ont.

3.*C. B. LEAVER, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. R. G. LEE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. J. C. LONGSTAFF, Toronto, Ont.

3. J. B. MACDONALD, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2.*A. D. MACDONALD,

1. J. A. MACDONALD, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. G. A. MACDONALD, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1.*A. E. MACGREGOR, Wilkeson, Wash.
Analyst & Draftsman, Wilkeson Coal & Coke Co.

1. E. G. MACKAY, Hamilton, Ont.

1.*G. G. MACLENNAN, Prince Albert ,Sask.
Assistant to A. St. Cyr, D.L.S.

1. D. D. MACLEOD, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. H. G. MACMURCHY, Toronto, Ont.
Post-Graduate Course in Ebgineering, University of Toronto.

3.*H. J. MACTAVISH, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

4. T. C. MCBRIDE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. S. G. MCDOUGALL, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1.*T. A. MCELHANNEY, Kincardine, Ont.

1.*P. J. MCGARRY, Merriton, Ont.

3.*L. R. MCKIM, Wyecombe, Ont.

1.*J. MCNIVEN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. J. I. MCSLOY, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2. A. W. R. MAISONVILLE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1.*N. MARR, Cochrane, Ont.
Engineering Staff, Transcontinental Ry.

1.*W. H. MARTIN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2. A. C. MATTHEWS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

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*Diploma with honours.

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3.*H. O. MERRIMAN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1.*D. J. MILLER, Orillia, Ont.
1. F. S. MILLIGAN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. P. E. MILLS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. J. P. MORGAN, Newmarket, Ont.
1. A. H. MUNRO, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. J. C. NASH, Hamilton, Ont.
Draftsman, Canadian Westinghouse Co.
1.*V. A. NEWHALL, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
2.*W. E. NEWTON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1. F. T. NICHOL, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1. C. M. O'NEIL, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. C. E. PALMER, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. G. C. PARKER, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. K. K. PEARCE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
3. C. H. PHILLIPS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1. D. E. PYE, Cranbrook, B.C.
1. W. S. RAMSAY, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto
3. B. J. REDFERN, Toronto, Ont.
1. H. C. RITCHIE, Calgary, Alta.
1. O. W. ROSS, Lachine, P.Q.
With Dominion Bridge Co.
1. W. F. B. RUBIDGE, Dixie, Ont.
3. W. C. SHAW, Toronto, Ont.
1.*W. C. SMITH, Two Harbors, Minn.
With D. & I. R.R. Co.
5. G. E. SMITH, Toronto, Ont.
2. R. J. SPRY, Greenwood, B.C.
Metallurgist, The B. C. Copper Co.
2. A. L. STEELE, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
2.*H. M. STEVEN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.
1.*L. I. STONE, Toronto, Ont.

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*Diploma with honours.

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3. A. L. SUTHERLAND, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. E. A. TERNAN, Toronto, Ont.
Engineering Dept., Canadian General Electric Co.

5.*W. H. THOM, Watford, Ont.

3. H. B. THOMPSON, Wellington, Ont.

3. R. M. A. THOMPSON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

2.*C. G. TITUS, Gowganda, Ont.
Manager, The Bartlett Mines.

3. K. M. VANALLEN, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. L. T. VENNEY, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. N. WAGNER, Toronto, Ont.
Bridge Dept., Canada Foundry Co.

1. R. M. WALKER,

2. T. WALTON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. G. A. WARRINGTON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3. M. B. WATSON, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3.*H. M. WHITE, Chatham, Ont.

4. W. S. WICKENS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3.*G. K. WILLIAMS, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1.*W. H. WILSON, Toronto, Ont.
Fellow in Physics, University of Toronto.

1. G. R. WORKMAN, Grand Mere, Que.
With the Laurentide Paper Co., Ltd.

3. L. A. WRIGHT, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

3.*A. W. YOUELL, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

1. W. S. YOUNG, Toronto, Ont.
Post-Graduate Course in Engineering, University of Toronto.

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*Diploma with honours.